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Safety Maintenance

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Cover picture from Authenticated News: Firemen apply foam compound to burning truck. Photo by Don Casper.

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it's SAFE to say

● BUILDING CASTLES IN SPAIN

One need be no professional flag waver or candidate for public office to recognize, and proclaim, that we in this country have no superior and few, if any, equals in injury-prevention effort. Other countries may beat us to the moon but this roving editor is willing to wager that when we do reach that planet, we will carry some form of safety equipment and certainly a book of safety rules intelligible to any possible moon people.

Accident prevention techniques that we normally take for granted apparently have not been imitated very widely in every other country. For example, in Malaga, Spain last month these eyes saw construction workers putting up a large apartment building and walking around bent over under the weight of heavy granite blocks while wearing canvas, rope-soled shoes more suitable for playtime on the beach. Also, hats of flimsy straw seemingly were intended to protect the wearer only against the bright sun of Andalucia. Certainly, this picturesque headgear would be ineffectual against a falling pebble, let alone a descending sledge hammer.

Men chipping stone had no more eye protection against flying particles than the workmen who put up the pyramids of Egypt. Finally, this reporter gave up his attempt to buy a pair of work gloves in a Spanish city boasting a population of a quarter-million inhabitants. Thin, surgical-type gloves could be obtained in any hardware store but—as an appendectomy was not part of the over-all plan—canvas or heavy-duty work gloves were needed. (The next sound we will hear is a loud protest from the Spanish diplomatic corps citing the widespread use of safety equipment in that delightfully fascinating country!)

In justice to actual facts, let it be known that in another part of the same city, workers digging up sidewalks for electrical installations were equipped with ultra-modern safety helmets but were dressed otherwise only in bathing trunks while wearing no shoes of any kind . . . but then the lowly-paid Spanish laborer has a strong sense of independence coupled with a fervent belief in the efficacy of prayer to his patron saint for protection against all harm, industrial or otherwise . . . which leads us to

● CAN IT BE TRUE IN THIS COUNTRY?

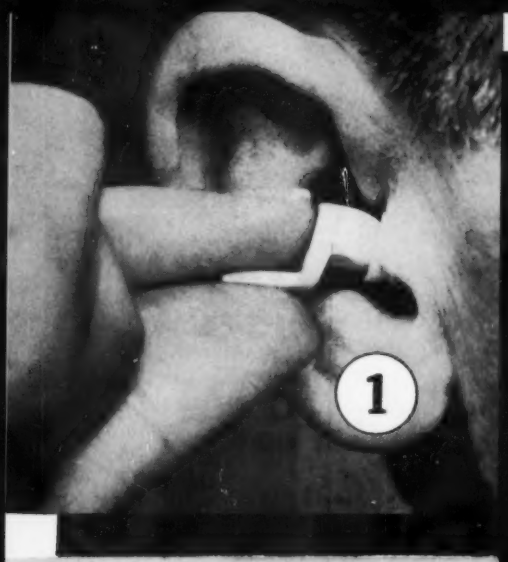
According to headlines of a semi-weekly newspaper published in northern New Jersey, all work came to a standstill recently when mine workers employed at a local steel company refused to wear prescribed safety equipment while on the job, according to a spokesman (anonymous) for the management. According to the front-page story, the controversy centered around a company rule that workers must wear respirators and eye protection devices and the work stoppage violated the terms of the management-union contract.

A reading of the far from complete story indicates that all the true facts obviously did not appear in the newspaper and there may have been another or further reasons for the halt. Certainly, management of any reputable company is not likely to insist upon the use of protective equipment unless it is necessary to protect employees against the almost certain tragedy of industrial injury. Equally certain is the fact that the AFL-CIO has made giant strides in educating its rank-and-file in the need for and use of safety equipment. Perhaps, the reporter covering the story goofed in not uncovering all the facts. Fortunately, there are not many unions that would play games with the eyes and lungs of their members by encouraging work stoppages merely in protest against the use of devices designed to keep those members as active dues-payers.

● ON TO CHICAGO

The world's largest safety convention and exhibit, the National Safety Congress, sponsored by the National Safety Council opens for a full week in Chicago the week beginning October 16th with headquarters at four prominent loop hotels and with a vast exposition of safety products, devices and services designed to show the latest advances in protective equipment.

Certainly, this largest and most informative of all national safety meetings should attract visitors from all parts of the country who can see and hear the latest injury-prevention developments and learn the answers to "What's New".



NEWS FROM AO

1 New Hear-Guards protect ears . . . reduce harmful noise but let in normal conversation. Soft, sanitary, molded white plastic inserts, available in 3 sizes.

2 New unit first aid kits, with blaze orange lettering you can really see . . . 4 sizes designed for ease of location in an emergency.

3 New AMBU* Rescue Breathing Equipment, a portable resuscitator that can be used anywhere, goes to work in seconds, simple enough for anyone to operate.

New: for daily protection and emergency first aid

Here are three recent AO introductions which are all-important to a complete safety program. New Hear-Guards offer noise attenuation superior to any other type of ear plugs now on the market. Easy to insert and comfortable to wear, three sizes (small, medium and large) in different colored carrying cases insure the right fit for each wearer.

You can't miss the blaze orange letters on the new 10, 16, 24 and 36 unit first aid kits. Easy to locate, the rugged steel cases have built-in wall brackets, carrying handles and snap locks. Rubber gaskets seal out dirt and moisture. Each kit contains the highest quality first aid materials, with individually marked packages and instructions on use.

When artificial respiration is needed, every second counts . . . and AO's new AMBU Rescue Breathing Equipment is ready to go to work *fast*. Portable kit contains foot-operated suction pump, to clear throat and mouth if needed, and easy-to-use resuscitator. Requires no electricity or other connections; the ideal supplement to mouth-to-mouth rescue breathing.

For further information on any item, contact your nearest AO Safety Products Representative, or write for detailed product literature.

*AMBU is a Trade Mark

Your Surest Protection . . . AO SURE-GUARD Products

American Optical
COMPANY

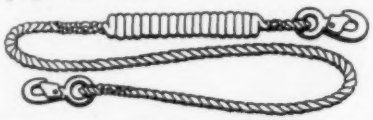
SAFETY PRODUCTS DIVISION • SOUTHBRIDGE, MASSACHUSETTS

(For details, use # J-2 on card on page 33)

DON'T find out by accident

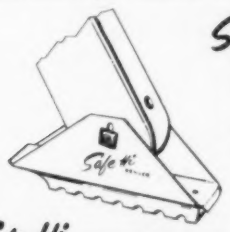
In safety equipment, second best just won't do!

Get the *facts* on the safety equipment you need. For 29 years, the Rose Manufacturing Company has been designing, testing, and manufacturing the finest safety equipment in its field.



Safe-Hi UNOLYN COIL SHOCK ABSORBER AND LANYARD

The Safe-Hi Unolyn Shock Absorber and Lanyard are safe two ways! A 50-inch length of Nylon Lanyard is coiled around a 10-inch length of Unolyn. After the Unolyn has stopped the fall and absorbed the shock, the Nylon lanyard retains full strength and safety. Unolyn s-t-r-e-t-c-h-e-s to 5 times its own length—one pound of Unolyn absorbs up to 25,000 foot-pounds of kinetic energy—to guard against broken ropes, anchors, belts and broken men due to impact in stopping falls!



Safe-Hi LADDER SHOES

Safe-Hi Ladder Shoes hold on all surfaces because they combine fibre and neoprene in the tread. This combination holds any ladder safely on wet, dry or slippery surface. The self-sharpening steel spike flips down for ice or snow.

Listed by Underwriters Laboratories for all surfaces. Also available in spark-resistant metals.

Safe-Hi CHEST-WAIST BELT

The Safe-Hi "Chest-Waist" belt is the *safest* belt made for workmen in high places, because it *divides* the shock load to two separate areas of the body—the chest and the waist. It also assures proper adjustment; the shoulder-supported chest belt can be worn loose for comfort, but the un-supported waist belt must be *worn* snug, thus preventing the fatal "slip-out" accident in a fall.

Other Safe-Hi Safety Belts include Car Dropper's Belt, Grab Belt, Heavy-Duty Construction Worker's Belt and Window Cleaner Belt.

Safe-Hi AUTO SEAT BELT

The "all nylon" Safe-Hi Auto Seat Belt has been safety-engineered to reduce crippling injuries and deaths resulting from highway accidents. The entire belt assembly, including the floor hardware, test far beyond C.A.A. rated strength for airplane seat belts! The 2-inch-wide webbing is 100% nylon, shock-absorbing, very long wearing and easily kept clean. It is light and comfortable to wear, and can be instantly adjusted or released. The Safe-Hi Auto Seat Belt will fit any person, any seat and any car or truck.

OTHER SAFE-HI PRODUCTS

Other Safe-Hi Products include the Safe-Hi Ladder Climber, Chisel Grip, Rope Grab Shock Absorber, Ladder Lash Pole Grip, Wall Grip and Adjustable Bo'suns Swing.

You're sure you've got the best with **Safe-Hi**

rose manufacturing co. R9-1

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(For details, use Key # J-3 on card on page 33)

THE FUTURE SHOWS

Winnipeg, Canada *September 7–8*

1961 Annual Meeting of the Canadian Industrial Safety Association (Fort Garry Hotel). N. D. Simmons, Executive Director, Canadian Industrial Safety Assoc., Room 317, 207 Queen's Quay West, Toronto 1, Ont.

Greensboro, N. C. *September 12–14*

Third Annual Southeastern Plant Maintenance & Engineering Exposition (War Memorial Coliseum). John Harden Associates, P. O. Box 3173, Greensboro, N. C.

New York, N. Y. *September 25–28*

Second Industrial Building Exposition & Congress (Coliseum). Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Philadelphia, Pa. *September 26–28*

Sixth Annual Sanitation Maintenance Show (Hotel Sheraton). Leonard S. Rogers, Manager, Sanitation Maintenance Shows, Inc., 310 Lexington Ave., New York 16, N. Y.

Houston, Tex. *October 10–12*

Twelfth National American Standards Association Conference. American Standards Association, 10 E. 40th St., New York 16, N. Y.

Chicago, Ill. *October 16–20*

Forty-Ninth Annual National Safety Congress & Exhibition (Headquarters at Conrad Hilton Hotel). R. L. Forney, Secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Pensacola, Fla. *October 27–29*

Florida State Industrial Nurses Association Convention (Holiday Inn). Mrs. Aileen Liberis, R. N., Northwest Fla. Ind. Nurses Association, 8 North G St., Pensacola, Fla.

Philadelphia, Pa. *January 22–25*

Thirteenth Annual National Plant Engineering & Maintenance Conference and Show (Convention Hall). Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

What inspires people to make suggestions to their employers? This is a question which has been given the deepest consideration by every company which has a suggestion system.

Actually, there are many answers. Some people are attracted by the cash awards. Others work for recognition in their plant or community. Some strive for prestige among their fellow workers.

But there is another significant reason why people make suggestions—one that is sometimes overlooked. It's a very personal reason. A person may make a suggestion to protect himself—his health, his fingers, his very life.

If an employee fears he may lose an eye or fall down a ladder in the course of his ordinary work, it is highly likely he will suggest a safer method for doing the job. When he has to breathe foul air on a particular operation, he may be inspired to suggest a way to eliminate the bad air. True, he knows he will be given recognition and be rewarded for his suggestion, but these are additional incentives. Self preservation is perhaps the strongest motivator.

After all, the employee doing the job—the fellow closest to the process—is usually the first one to recognize the job hazards. For example, a loader at one of our bulk plants noticed that it was very difficult to take the caps off bottled gas tanks. He reasoned that it was caused by the pressure, inside, of a small amount of escaping gas. He also figured out that this pressure was dangerous to him. So he came up with an idea—drilling a small hole in the cap to let the gas escape and relieve the pressure. The cost of drilling a hole was a dollar, but the cost of the arm or the hand he might have lost is incalculable.

Or again, an employee at Crucible Steel worked in an area where there was a danger of being hit by pieces of flying steel. He made a suggestion, and the company erected a shatter proof shield. Less than a year later, a worker was saved from injury as a result of that shield. The company's suggestion plan was a definite aid in making employees safety conscious.

Many suggestions make work easier. Better tools, jigs, or lifting equipment are recommended by employees, not because they are lazy, but because they want to make their work safer. The Public Service Company of New Jersey

Cooperation by the safety department and the suggestion program department works to the mutual advantage of the employer, employee, and the public.

has found that about 30 percent of their adopted ideas include some safety factor.

A suggestion program designed to serve the best interests of employer and employee, therefore, gives safety a place of primary importance. It will state specifically, as Esso Standard's program does, that ideas are wanted which will "contribute to the safety of fellow workmen or the public." The Kodak plan says, "The suggestion system offers an excellent channel through which employees may call attention to the existence of hazardous conditions and offer proposals for eliminating them."

The slogan, *Safety Is Everyone's Business*, is well known. "Everyone" includes the suggestion system personnel who make it their business to solicit and process employee's ideas—particularly ideas about safety. When a United Airlines employee submitted the idea about the rotating red light now found on all commercial and government airlines, someone who processed the suggestion had enough vision to realize how important to air safety the device could be.

Cooperate With Suggestion Department

Ideas on safety are going to come in if you ask for them. But they will really begin to flow if suggestion system people demonstrate a lively cooperation with the safety people.

The Illinois Central Railroad did an outstanding job in this connection in a special campaign. It was called "Suggestions on Safety," and it was worked out jointly by the suggestion and safety departments. Both departments publicized the need for safer operation of the line by using separate posters and promotion. Both departments specifically asked for safety ideas. The two functions, safety and suggestions, were tied in together to make everyone aware of the value the company put on the program and the intimate relation between the two. Of all the ideas received that year, 30 percent pertained to safety. It is significant to point out that the company unit which won first place in their annual safety award contest recorded safety suggestions as 33 percent of their total.

Similarly the U. S. Bureau of Indian Affairs wanted to conduct a "Hazard Elimination Contest." To accomplish this, they made use of their established awards program machinery.

The Humble Division of our company in Texas has a good suggestion program too. From the outset, they have tied safety into their suggestion system. Last year, 19 percent of all their accepted ideas directly concerned safety or had prominent safety factors. Incidently, these suggestions earned some $1,800, in awards. Most of these ideas were concerned with the hazardous occupations involved with production—getting oil out of the ground. The heavy equipment, the TNT, the high drilling rigs—all present safety problems of tremendous magnitude. It may not be surprising, then, that in the production department, one out of every three ideas concerned safety. Nor should it be surprising that management has the Safety Department review and approve every employee idea that shows any measure of safety.

The priority given to safety suggestions by some companies is illustrated by IBM. They, naturally, use their IBM punch cards to process their suggestion system. Special punches are made in the suggestion record cards identifying safety ideas, and controls are maintained to assure proper processing. Safety ideas are filed separately and are readily available to safety directors and to assist in safety studies. Management, knowing that safety and efficient production are inseparable, sponsors both safety programs and the suggestion system. **The two must work together—they must cooperate!**

Anyone anxious to promote safety, therefore, should ask himself two simple questions. First, *"Is my safety department making the fullest use of my company's suggestion system?"* And second, *"Are these two departments working together efficiently?"*

Here is an example of this cooperation. An employee at our Baton Rouge refinery devised some inexpensive by-pass valves on a phenol treating unit. Plant management and the suggestion people accepted the idea because product and equipment would be protected. The head of the Safety Department scrutinized the idea carefully too, and commented, "In addition to the damage from physical rupture, the release of large quantities of phenol would likely result in injuries to personnel over a large geographical area. This suggestion is a safety improvement of major proportions." In view of this assessment, a $1,200 award was granted. Again the suggestion and the safety people worked together.

This example also brings up an additional consideration. The head of the Safety Department was speaking not only of personnel inside the plant. He was also thinking of people outside the plant—the public. All of us can promote better community and customer relations by promoting safer plants and procedures.

Good Community Relations

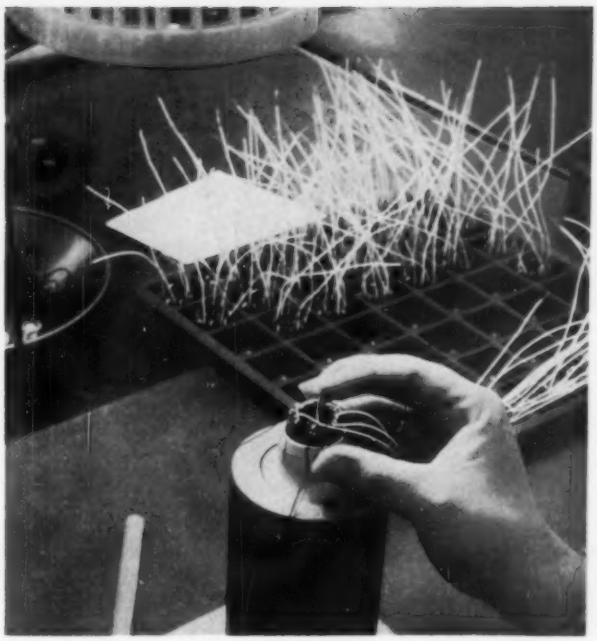
Many suggestions which our company has processed have resulted in controlling bad odors and not releasing them into the air for the surrounding community to breathe. At our Charleston plant, a suggestion provided a safer method for loading asphalt and eliminated a slippery condition on the pier. But even more important from a community point of view, it prevented asphalt from contaminating the water and the surrounding bathing beaches.

Many families have heating oil delivered to their homes. Suppose the truck moved or was pushed while oil was flowing into the storage tank. The result could be a frightful mess on the lawn and a very unsafe condition. One of our suggesters came up with an idea which tied in the fuel oil pump with the brakes of the delivery truck. Now, when the pump is operating, the brakes are set automatically, thus providing protection to the customer's property and safety for the neighborhood.

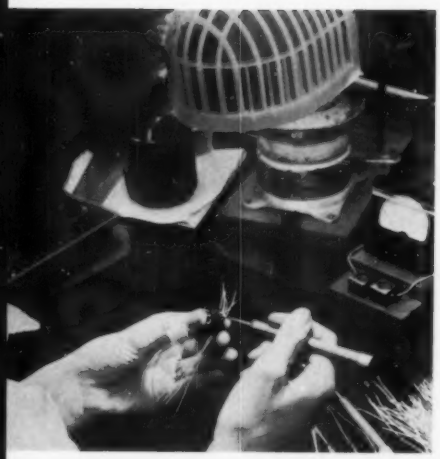
Drivers of fuel oil trucks around populated neighborhoods have made many other safety suggestions too. Additional rear-view mirrors were adopted, one for the highway and another for congested traffic

(Continued on page 23)

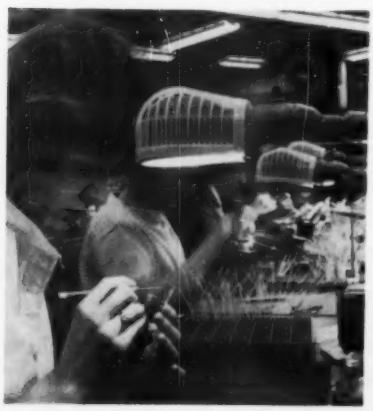
"Inserting Operation" during assembly of electrical apparatus is performed under a supplemented lighting system.



Good Lighting Replaces Aspirin



The supplemental system, delivering up to 750 foot candles, makes the task of soldering fine electrical wires easier.



Headaches are gone for these girls, wiring a fine electrical system, since extra lamps have replaced aspirin.

Diamond patterned fluorescent light system and supplemental table lamps enable these women to wire fine coils.

Here's one manufacturer who's found a way to take a headache out of his production . . . literally!

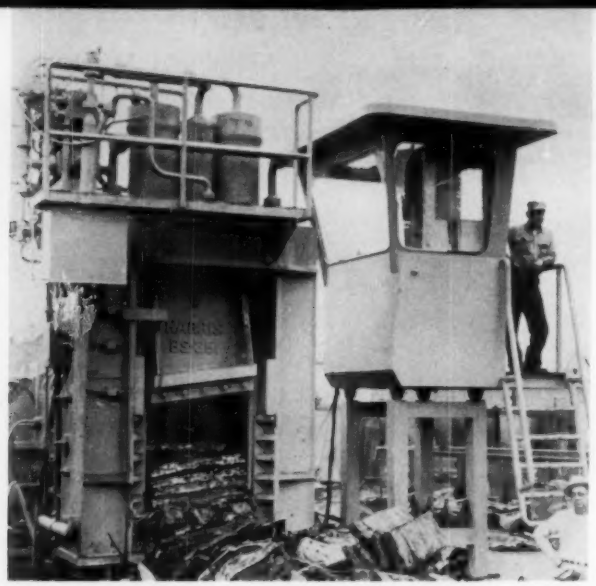
It happened at Scot Inc., in Downers Grove, Ill., producer of electrical coils and other equipment for servo-motors, synchro-motors and other electrical apparatus, when the company recently moved into new, better lighted facilities.

According to Scot Inc.'s President, Glen F. Graham, "Under our former lighting system we had only 50 to 75 footcandles. Today, with a newly designed lighting installation of grooved fluorescent lamps, we will maintain 200 footcandles and right now have about 230."

"The difference," he continued, "was very graphically put by our vice president of the electrical division, Maurice Jacobs, when he noted that 'It seemed that we used to give away aspirin by the barrel while now we hardly give away any! Indeed our girls are experiencing far greater comfort and less fatigue, and production quality and efficiency are benefitting.'"

The assembly operations at Scot. Inc. require fine work winding, inserting, tying down, forming and other operations to produce rotors and stators. The 200-plus footcandle general lighting system is supplemented with small directional

(Continued on page 17)



Make

A comprehensive survey of accidents connected with hydraulic baling presses has been completed by the Institute of Scrap Iron & Steel as part of the national group's continuing program on safety.

This is the second such survey on scrap yard equipment conducted by the Institute under the

ACCIDENT CASES: Taken from the

Case No. 1 Picking foreign material out of new chips when employee misjudged action of the pile and struck against sharp material.

Case No. 2 While loading a pit press by crane, injured was standing under the crane loaded with bales when the load slipped, dropping a bale on the man.

Case No. 3 While loading a press, employee was caught between the load and the press.

Case No. 4 In loading operation, helper was working on material in the baler when the operator moved the hopper, catching the helper.

Case No. 5 Worker was injured while handling sheet and bale ties.

Case No. 6 Press dock helper placed toes under skip pan, between pan and the dock, as pan was being lowered, resulting in loss of toe.

Case No. 7 During press charging operation, helper operated without authority and load pan crushed his foot.

Case No. 8 Worker fell into the box while pulling out a piece of foreign material.

Case No. 9 While charging caustic soda drum in press, caustic went into eye.

Case No. 10 While worker was checking material being loaded into press by crane, the crane boom fell, the grease fitting on the sheave striking the worker on the arm.

Case No. 11 Press operator was servicing press, climbing on a pipe when he slipped, injuring his back. Box man strained his back while pulling a wire out of the baler door.

Case No. 12 A helper was tramping material into the charging box while the cover was closing. He slipped and his knee was crushed by the cover.

Case No. 13 (a) A worker was pushing a bundle back for re-press and caught his toes between the bundle and the yoke.

(b) A man was waiting for the crane to feed the press when the hook slipped from the magnet and hit him in the back.

Baling-Press Work Safe

auspices of its national subcommittee on Safety of the Yard Dealers committee. The first dealt with the alligator shear and hazards which could be avoided in the operation of this particular type of equipment.

The basis of the new report on baling press safety was a 10-question form which was sent to all members of the Institute with the request that information regarding accidents involving baling presses be submitted on the form.

216 report forms were returned, indicating 219 pit presses and 49 vertical presses being used by the reporting members.

11 returns indicated no baling presses in use.

25 accident cases resulted in 28 disabling injuries to employees working with, or in the immediate vicinity of, this equipment.

138 first aid cases were reported.

141 yards reported no injuries.

Accident Types: It is evident

Survey Report on Baling Press Safety

Case No. 14 Maintenance man was checking and repairing pipe line. He cut his finger when he put it into the pipe to check it.

Case No. 15 While operator was checking the press, a piece of scrap fell from the magnet, ricocheted, and struck his left eye, causing loss of the eye.

Case No. 16 Repairman was repairing liner plates. He had failed to block the cover. The operator pulled the wrong lever. Repairman was killed by the cover.

Case No. 17 An employee walking around the pit, slipped and fell into the pit.

Case No. 18 While cleaning out the pit, employee had one hand resting against the front bar of the rail of the press while stooping to clean with the other hand. As crane was removing bundles from the front of the press, a bundle struck the hand resting on the bar rail.

Case No. 19 Two cases of back strain from turning over steel bundles by hand.

Case No. 20 Worker was caught between bales when he stepped between bales on discharge ramp as a bale was being ejected.

Case No. 21 Injured was caught between moving objects . . . while moving bales back to front of the elevator, he stuck his head in the elevator shaft.

Case No. 22 Worker was cleaning metals in the press shed when the door ran over his foot.

Case No. 23 Employee was helping charge material from hopper when hopper came down on his foot.

Case No. 24 Repairing press standing between rams which had not been blocked. Air compressor was turned on with the valves left open. When pressure came up, the ram retracted, pinning employee.

Case No. 25 Injured tried to throw a piece of metal into the hopper while the cover door was opening for the next charge. He slipped and two fingers were caught in the baler cover.

from the reports that most of the more serious injuries resulted from being struck by some object (such as bales, crane boom) or being caught between objects (such as bales, moving press parts). There were numerous cases of cuts and scratches from sharp materials and strains from slipping on oily surfaces. A number of reports indicated that the employee was working in an unsafe position.

Accident Cases: The page 8–9 table summarizes accident cases that resulted in serious injuries or death, and are listed as examples of the types of incidents which occur in baling press operations.

Recommendations: Additional tables give recommendations for safety in baling press operations submitted by reporting members. These recommendations may be generally classified as "Safe Procedures" and "Safety Equipment & Devices."

Conclusions: The final table summarizes the principal hazards of the operation of baling presses and also some additional recommendations for safety.

Picture by courtesy of Institute of Scrap Iron & Steel, Inc.

Safety Procedures for Baling Presses

1. **Seven reports emphasized the need for constant supervision and the development of safe working attitudes by supervisors.**
2. **Operator alertness was pointed out by 11 reporters. The importance of operators in safe baler operations was indicated in 5 recommendations for *responsible* operators, for good operators who will watch out for others, and for *one* operator to be in charge.**
3. **Nineteen reports recommended keeping the press area clear and clean at all times.**
4. **Eight recommendations concerned keeping all unauthorized personnel away from the press area.**
5. **Six suggested adequate training of personnel in their particular duties.**
6. **Cut out horseplay.**
7. **Hold group safety discussions.**
8. **Crane and baler operators should be located high enough to see complete baling operations at all times.**
9. **Designate walking paths to and around the baler.**
10. **Prevent relaxing of rules due to overconfidence.**
11. **Provide periodic safety inspections.**
12. **Provide a sufficient time allotment for maintenance.**
13. **Develop a standard routine for press operations.**
14. **Four suggested the development of a good method of signals for proper communications between press and crane operators.**
15. **Make certain that all men stand clear of the crane and load while charging the hopper or baler.**
16. **Provide proper safety measures for men entering pit for repairs, including prohibiting men from going into the pit unless the tramper is blocked and the master switch locked off.**

Safety Equipment & Devices for Baling Presses

1. **Require use of safety equipment (safety shoes, goggles, hard hats).**
2. **Install an emergency air valve to eliminate power to the cover.**
3. **Provide guard rails around pits.**
4. **On vertical presses, especially upstroke type, provide guard at floor level to avoid recoil of material.**
5. **Provide a protective shelter for men charging press.**
6. **Use a hand-line on magnet or bucket for good control.**
7. **Provide a horn or other warning device on crane.**

Conclusions

The prime hazards of the operation of baling presses are:

1. **Handling materials by cranes, from overhead, in the vicinity of workers.**
2. **Men working in the vicinity of moving machinery.**
3. **Manual handling of materials.**
4. **Maintenance within the pit with moving parts not blocked and controls made inoperative.**

In addition to following the above recommendations, for safe baling press operations, these recommendations should be put into effect.

1. **All pinch and squeeze points on hoppers and at ejection points should be eliminated.**
2. **All employees should be required to be in the clear before the hopper or rams are operated.**
3. **No materials should be passed over the heads of workers.**
4. **Suitable blocks should be provided and placed in pits before any employee is permitted to enter the pit and an employee who is to enter a pit must first lock out the controls and keep the key so that the press cannot be operated until he unlocks it.**

Another Injury Checked

Quick Action Prevents Conflagration

The wisdom of orienting employees in the use of emergency fire extinguishing equipment was demonstrated dramatically to the management of Butler Aviation at Midway Airport in Chicago recently.

Quick action by Arthur Pehlke, a mechanic, in activating a 150-pound dry-chemical wheeled unit probably saved the hangar and a B-25 plane from complete destruction by fire and explosion, with a probable heavy loss of life and possible interruption of all air service in and out of the airport, reported Joe Henebry, Butler's manager at Midway.

Although all safety precautions were being observed, he said, a series of freak mishaps touched off what might have become a conflagration, because the B-25's fuel tanks had just been filled and a 2,500-gallon high octane fuel truck was parked just outside the hangar door.

The first mishap occurred when a volatile solvent which the mechanic was using to clean the wings dripped onto the floor and formed a small pool.

Then an extension electric light being used for inspection purposes dropped off the wing. As the electric bulb shattered on the floor, the solvent ignited. Flames followed the dripping solvent up to wings and set fire to the fabric on the right aileron. Hastily descending the ladder, the mechanic accidentally knocked over the container of solvent and suddenly 10-foot high flames enveloped the wing.

Pehlke, who had been well briefed on the use of fire equipment in an emergency, raced for the wheeled unit and activated it in a matter of seconds, smothering the fire before the fuel tanks could explode.

Mr. Henebry estimated damage to the plane at approximately $2,000. He admits to nightmares when he thinks of what might have happened.

By courtesy of Ansul Chemical Co.

NO ALIBIS FOR UNSAFE DRIVERS

Under the intriguing title of "Highway Immorality," John Wildman, Superintendent of the Engineering Department of The Employers' Insurance Group, has written for his company's house organ, *The Employers' Pioneer,* an eye-opening article on the factors involved in highway accidents. Mr. Wildman writes:

There are, in the United States, more than 70 million registered motor vehicles, driven by about 84 million licensed drivers. These vehicles traveled about ¾ of a billion miles. It takes no imagination to realize the tremendous exposure on our streets and highways in the light of such statistics.

Accident Toll

Let us examine further the results of this exposure: what it is doing to our economy, and some of the reasons behind the results. First, the results.

In 1959, which is the latest complete year for which we have statistics available, there were 37,800 deaths caused by motor vehicles, in addition to 1,400,000 disabling injuries. This carnage cost an estimated 6¼ billion dollars. These are cold statistics; they do not reflect the human loss of life, limb and suffering. No known device can do this.

Complex Motivations

The study of motor vehicle accidents is a complex one. Engineers, psychologists, doctors and other scientists have been working on the problem for years to determine *why* these accidents occur. Hundreds of books and thousands of articles have been written on the subject. Mass education is being attempted, laws are being constantly revised, cars and appliances are being improved, but despite all of these actions and devices, the trend has been an ever increasing spiral of death and destruction.

What about the driver? Does the age or sex bear any relationship to the cause of the accident? Tables 1 and 2 throw some light on these questions:

Table 1: Accidents by Age Groups

Age Group	% of Total Drivers	% of Fatal Accidents	% of All Accidents
Under 20	7.2	11.6	13
20–24	11.2	16.8	15
25–29	12.7	13.4	14.1
30–34	12.5	11.5	11.2
35–39	11.6	9.1	10.2
40–44	10.3	8.9	9.0
45–49	9.1	7.8	8.1
50–54	7.8	5.9	6.2
55–59	6.2	4.6	4.8
60–64	4.7	3.9	3.4
65–69	3.1	2.9	3.0
70–74	2.1	2.1	1.1
75 & over	1.5	1.5	.9

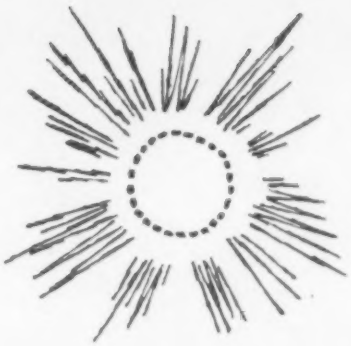
Table 2: Driver Accidents by Sex

Fatal Accidents	
Male	Female
40,400	5600

All Accidents	
Male	Female
14,400,000	3,600,000

NUMBER OF DRIVERS—
Male: 59,000,000 **Female:** 25,000,000

Does the day of the week or the month of the year throw any light on the subject of motor vehicle deaths? Perhaps, but not conclusively. There is a somewhat higher accident rate on Saturdays and also from August through December.



What were weather conditions at the time of these fatal accidents? There is no alibi—it was clear or cloudy 85% of the time:

Fatal Accidents

Clear — Cloudy	85%
Rain	10%
Fog	2%
Snow	2%
Other	1%

ALCOHOL & GASOLINE

The drinking driver should be considered in such a study. In this area the figures are understandably not so well documented, but the National Safety Council points to the following:

1. One out of every five drivers involved in a fatal motor vehicle accident had been drinking.

2. One out of every three fatal motor vehicle accidents involved a drinking driver.

3. About 10,000 motor vehicle fatal accidents involved a drinking driver.

4. One out of four adult pedestrians killed by motor vehicles had been drinking.

5. About 1500 of the 5700 adult pedestrians killed had been drinking.

BEHIND THE WHEEL

What were the circumstances? To say that accidents are caused by improper driving is an over-simplification. However, more than 90% of all fatal accidents come under this category with excess speed as the Big Killer.

Improper Driving 90.3%

Over speeding	31.0%
Too far to Left	15.8%
Fail to yield right of way	12.4%
Passed Stop Sign	5.2%
Improper overtaking	4.4%
Disregard of Signal	3.6%
Improper Turn	1.6%
Follow too closely	1.2%
Other	15.1%

The figures presented here are cold statistics of occurrences that have already taken place. No figures which take into account the factors of attitude, fair play, or application of the Golden Rule, are available, nor will they ever be so, yet these are major elements of all accidents. To compound the difficulty, they are also the uncontrollable ones, as far as physical laws are concerned. They can be controlled by only one person—the man behind the wheel. Until we learn to control ourselves, improve our attitudes to apply the concepts of morality to our driving habits, the spiral will continue upwards.

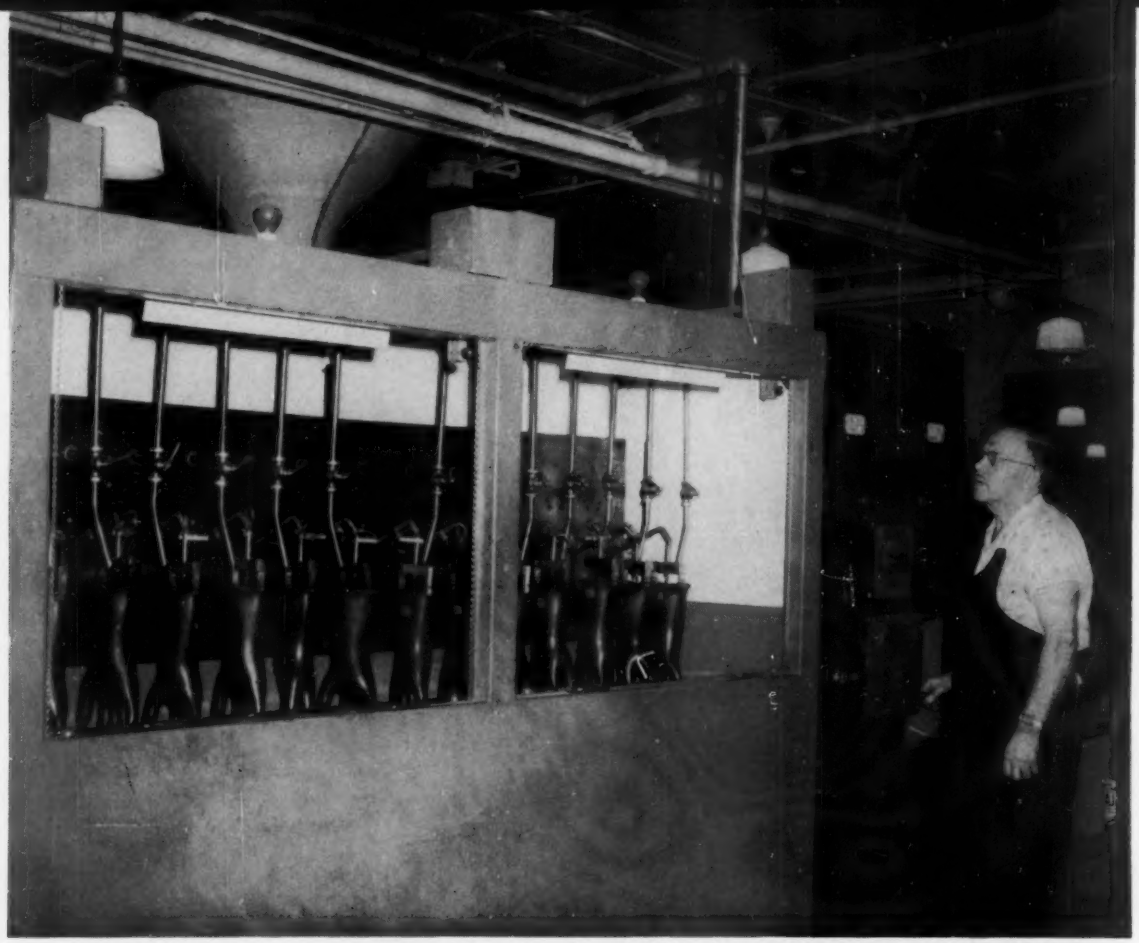


Fig. 1 Photo of rubber glove testing machine shows gloves held by clips while being lowered into tank for test.

Keep Safety

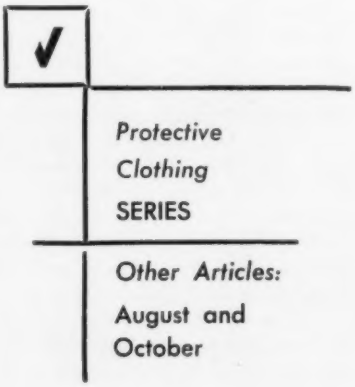
by **F. L. WILLIAMS**
Chief Test Engineer
Test Bureau
Consolidated Edison Co. of N. Y., Inc.

Self-preservation being the first law of nature, it is only natural that man, since early time, has been constantly devising ways and means for his own protection. In our modern society the safety devices available for his use are numerous, but he has learned the hard way, regrettably—even in some cases at the cost of life—that these safety devices must have high quality and have it maintained. It is the function of the laboratory, by adherence to rigid specifications, inspections, and tests, to assure this high quality.

Let's turn the spotlight on the part played by the laboratory in maintaining the quality of personal protective equipment in a large utility. By personal protective equipment, we mean the devices that are used to protect an employee from electric shock, falls, falling objects, suffocation, cuts and bruises.

Acceptance Tests

In Con Edison this equipment is purchased under specifications



sponsored by ASA, ASTM, EEI or by company specifications. It is the responsibility of the laboratory to make the necessary tests to see that protective equipment meets all specification requirements.

Adequate protection against electric shock is provided only by the proper testing, use, handling and coordination of several protective devices. The most popular item in this group is the high-voltage rubber glove. In the Con Edison laboratory, acceptance tests are made on 1200 ASTM, Class 11 gloves each month. These tests consist of:

1. A thorough inspection on both the inside and the outside surface of each glove by trained inspectors working with an illumination of 400 to 500 foot-candles of incandes-

cent light. All gloves must be free from blisters, pinholes, cracks, protuberances, indentations, surface breaks, imbedded foreign matter and other harmful physical defects which can be detected by a thorough test or inspection.

2. An electrical test of 15,000 volts for 3 minutes. It is applied to 12 gloves at one time in a company-designed automatic glove testing machine which we believe to be the fastest glove testing machine in the world. (Figure 1) All electrical tests are made with a 60-cycle a-c voltage.

3. Electrical destructive tests are made on a one percent sample of gloves. Voltage is applied to the sample glove until breakdown occurs and specimens are then cut from these gloves to determine the physical properties of the rubber such as tensile strength, elongation and set.

Each satisfactory glove is then identified by a company rubber label cemented on the cuff, giving the serial number, manufacturer and the date of acceptance.

As gloves are required on the System, they are withdrawn from stock by the laboratory, inspected and given a test of 12,000 volts for one minute before being issued to the various company groups. In Con Edison, all high-voltage rubber gloves are used with leather protectors and may be used on circuits where the voltage does not exceed 5,000 volts between conductors or from conductors to ground.

After two weeks of use the gloves are returned to the laboratory for retest. A few gloves used as supplementary protection in the handling of switch sticks are returned after two months of use. In no case can a primary glove be used after two months or a supplementary protection glove be used after ten weeks of its last test date. The laboratory is required to make retests on 7,000 gloves each month. Each glove is given a thorough surface inspection on both the inside and the outside of the glove and then given a high-voltage test of 4.5 Kv for one minute followed by a 12,000 volt test for one minute. Gloves are then disinfected, rinsed in clean water, dried and stamped with the date of test and reissued to the field.

Gloves rejected on inspection with small cuts or scratches in the upper part of the cuff and passing a 12,000 volt test are converted to low-voltage gloves by cutting two inches from the cuff and attaching a label restricting the use to 350 volts or less.

Other Insulating Equipment

Other insulating protective devices such as rubber sleeves, blankets, mats, line hose and hoods are handled in a similar manner but with some variations in the specified test requirements. All protective devices other than gloves are given a retest of 10,000 volt for one minute.

To assure an adequate supply of

Fig. 3 Test set-up for impact test on safety headgear in accordance with specifications for electrical helmets.

Equipment Safe

Fig. 2 Photo shows method of making tensile proof tests on lineman's safety strap at 800 pounds for one minute.

A Salute to

A SAFETY IDEA

No Missing Digits

A lucite paper-cutter guard that prevents slicing of fingers while cutting paper was recently designed by George Wolnez, Area Safety Engineer, Aerojet-General Corporation, Liquid Rocket Plant, Sacramento, Calif. The guard is easy to install and can be inexpensively constructed of ⅜ inch lucite and two aluminum or steel supports. The guard is designed to permit maximum use of office paper cutters regardless of size. In the interest of safety, the Aerojet Liquid Rocket Plant Safety Department is offering the design to any and all interested Safety Engineers without charge or obligation.

---

insulating protective devices in cases of severe storms, the loss of our supply due to fire or strike at the manufacturer's plant or the manufacturer's loss of source of supply of good porcelain forms, Con Edison has established the following minimum stock: 8,000 rubber gloves; 1,000 sleeves; 1,500 line hose; 300 hoods; 325 blankets and 100 mats.

Insulated tools for both high-voltage and low-voltage use are given an electrical proof test in the laboratory before going into company stock.

For protection against accidental contact when working on low-voltage, rubberized sheeting is provided. Samples of this material are sent to the laboratory for both physical and electrical proof test.

The quality of leather protectors used to protect our rubber gloves and the leather gauntlet work gloves are controlled by specifications and laboratory tests and inspections.

To protect employees from falls Con Edison provides linemen's belts, scaffold belts and bunker belts. These belts are purchased under company specifications which require that belts be fabricated with nylon webbing and company-tested hardware. All new belts are inspected and then given a tensile proof test. (Figure 2) A sample of webbing is furnished with each shipment for a breaking strength test. A single thickness of 1¾" wide nylon webbing used in our pole straps has withstood pulls of 10,000 pounds. All belts are returned after six months of use for inspection and a tensile proof test of 800 pounds. Body straps, however, are tested at 650 pounds.

Head Protection

Protection from falling objects is obtained by the use of hard hats. These are purchased under EEI specification for Electrical Workers Insulating Safety Headgear. A five percent sample of each shipment is sent to the laboratory. Here each sample hat is subjected to an impact test of 40 foot pounds in a special testing machine. (Figure 3) The temperature of the chamber at the bottom can be varied from −25°F to 160°F. Another test is to drop a Plumb Bob from a height of ten feet.

The electrical tests consist of applying 15,000 volts, 60 cycles for one minute between water on the inside and water on the outside of the hat. The ultimate electrical breakdown must be over 20,000 volts.

The physical tests consist of determining the dimensions and weight. Specimens are then cut from the hats for water absorption and flammability tests.

Respiratory

Fresh air masks are used to provide the employee with a supply of fresh air when working in a contaminated excavation. These masks receive an acceptance test before being issued to the field and are returned to the laboratory after twelve months of use for a retest. A thorough inspection is made of each item making up the fresh air mask assembly and the operation of all valves are carefully checked. The breathing tubes and the air supply lines are subjected to an air pressure test underwater, while the harness consisting of shoulder straps, belts and hardware are given a tensile proof test. The shoulder straps are given a 250-pound test while the belts, rings and attachments are given a 300-pound proof test.

The modern laboratory cannot be content with simply making acceptance tests on equipment being used for personal protection or on the retesting of same. It must be awake to the constant need for developing new and better devices

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(For details, use # J-4 on card on page 33)

to protect the employee of today and tomorrow. Simpler and better methods of test are always needed. In Con Edison we have been investigating such tests as power factor and dielectric absorption. We should keep an eye on the rapidly advancing field of non-destructive testing. Here we may find some tools that may be adapted to the testing of personal protective equipment. The laboratory must always be mindful of its responsibility in maintaining personal protective equipment in first class condition through laboratory testing.

From an address presented at the Greater New York Safety Convention. Pictures by courtesy of Con Edison Co. of N. Y., Inc.

Good Lighting

(from page 7)

lights at critical operations so that up to 750 footcandles may be obtained for fine work with size 45 magnet wire.

Both Graham and Jacobs have noted other benefits since moving to the new, better lighting system. They find that the girls seem less inclined to need extra breaks due to fatigue. (Standard work breaks are scheduled every two hours.) In addition, both notice a greatly increased ability and desire to keep the manufacturing area clean.

Before moving to the new assembly area, Graham called in a lighting engineer to help plan the light requirements.

Graham set down the conditions he wanted: a comfortable working environment that would lead to the highest possible efficiency. He felt that lighting was "the most important contributor to that goal."

The company has paid careful attention to every visual detail. For instance, sun glare problems are reduced with the use of frosted and coated windows. Contrast has been another problem: Contrary to the normal recommended practice of using a light colored, high reflectance work surface, Graham uses darker felt surfaces for many of his key tasks. The reason? The contrast between the enamel coated wire and the stripped wire ends which shine out against the dark background simplified the connecting and soldering operation.

The lighting engineer, using a portable demonstrator, was able to let Graham pre-select the exact lighting level he desired to perform the operations in his assembly work. After testing actual work samples from his plant, he settled on a minimum level of 200 footcandles for general lighting, and determined absolute need for supplemental directional lighting for critical tasks.

Graham himself designed a "diamond pattern" for fixture mounting, in contrast to the more common parallel rows of fixtures, in an effort to help reduce shadowing to a bare minimum. This gives the benefit of some cross shielding from any direction. The company selected grooved fluorescent lamps on the basis of actual competitive tests, finding their high light output performance, coupled with their long life, gave the best results.

Pictures by courtesy of General Electric Co.

Edited by HENRY M. GROSMAN
Counselor at Law, Newark, N. J.

MEMBER . . . . . .
Master Superior Court, New Jersey
American Bar Ass'n, New Jersey Bar Ass'n,
Chairman, Committee on Workmen's Compensation, New Jersey Bar Association
National Federation Insurance Counsel
Past Commander, American Legion, Post 10,
. . . . . Newark, N. J.

GOING TO AND FROM WORK—Carrying Employer's Money at Time of Injury

The claimant, a nursery school teacher, was acting for the vacationing supervisor. Part of her temporary duties was to collect certain fees which were to be kept by her over the weekend so they would not remain overnight in the school. She contended that, since she was carrying her employer's money when she was struck by an automobile while on her way home, the employer was liable for compensation. She was awarded compensation for her injuries.

On appeal, the court stated that the award was improperly made, and ruled that she was not entitled to any workmen's compensation benefits. The court stated that there was no casual connection between the fact that the claimant was carrying her employer's money and the injuries she received. The same thing would have happened with or without the money, and she was not injured during her fixed working hours. The court ruled that compensation was to be paid for injuries resulting from hazards of work and duties of employment, not while going to and coming from work over routes similarly encountered by the general public.

U. S. Fidelity & Guaranty Co. vs. Rowe; Florida Supreme Court, 1961

SKYLARKING—Statute Construed

An employee recovered compensation for injuries sustained because of his voluntary participation in skylarking activity. The employer appealed entirely on the narrow ground that N. J. S. A. 34:15-7.1 barred this recovery. However, the court construed that section of law to mean that where an employee is injured by skylarking (whether he be an instigator thereof, or a participant therein, or not) he is entitled to recover if the practice of such skylarking is known to and acquiesced in by the employer, since such knowledge and acquiescence result in the activity becoming an incident of the employment.

Diaz vs. Newark Industrial Spraying Inc.; New Jersey Superior Court, Appellate Division, 1961

PORT-O-RUNG
U. S. Patent 2,945,549
Foreign Patents Pending
Auxiliary rungs to replace any rung, and any number of missing rungs, in all permanently installed upright ladders.
GAGNON ENTERPRISES
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(For details, use # J-5 on card on page 33)

DEATH BENEFITS—SUICIDE—Causal Connection—Brain Damage—Mental Derangement

This is an appeal from a decision and award of the Board which found that death by suicide in 1957 was associated with and related to injuries suffered in an industrial accident during 1954. Decedent, 42 years of age in 1954, while working as a carpenter and in the act of climbing a ladder, received an electric shock and was thrown to the ground. He received multiple injuries including a fractured skull and a subcranial hematoma in the frontal and parietal region of the brain, which condition necessitated a craniotomy on April 19, 1954. Thereafter, he suffered from loss of speech, headaches, dizziness and convulsions. The medical testimony as to the association of the accident to the subsequent suicide was in sharp dispute but the court is of the opinion that the testimony offered by claimant-widow was of sufficient probative value to sustain the decision. There was medical proof that the symptoms and conditions —aphasia; vertigo; convulsions sufficient to cause fractures of the back and necessitating the wearing of a brace with severe pain and discomfort; irritability; depression; loss of sexual desire; apprehension and discouragement—cumulatively and over a period of three years caused an emotional strain, leaving dece-

dent feeling helpless and restless. It should be emphasized that, from the time of the accident until death, there was a gradual accumulation and aggravation of all of these conditions finally dramatized by a fall which resulted in extensive bleeding from numerous lacerations and which happened on the evening of his death. While the word "insanity" is lacking in the testimony, that such mental condition did develop is best demonstrated by his actions and definitely supports the statements of the employer's and insurer's doctors that decedent was psychotic at the time of his death. Award affirmed.

McIntosh vs. E. F. Hausman Co.; New York Supreme Court, Appellate Division, Third Department, 1961

PRESUMPTION OF ACCIDENTAL FALL —Conflicting Medical Testimony— Fractured Skull and Subarachnoid Hemorrhage

Claimant's husband, employed as a dress packer in a buying office, fell on the employer's premises and sustained a fracture of the skull. He died the following day in a hospital, the cause of death being a subarachnoid hemorrhage and fracture of the skull. The main problem in the case is whether the presumption that the fall was accidental within the Workmen's Compensation Law was answered by "substantial evidence to the contrary" in the expression of medical opinion in this record. No doctor in the case was able to say certainly that the subarachnoid hemorrhage began before the decedent fell. The fall itself was violent and caused a fracture of considerable magnitude. The medical opinion that—either the blow (which could produce such a fracture) or the fracture itself could have caused the subarachnoid hemorrhage—presented an open question of fact which in the opinion of the court permitted application of the presumption. The medical record is sufficient to reinforce the presumption of the accident. Award for claimant affirmed.

Kurash vs. Franklin Stores Corporation; New York Supreme Court, Appellate Division, Third Department 1961

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(For details, use Key # J-6 on card on page 33)

Instrument-Automation Conference & Exhibit

The Instrument Society of America's 16th Annual Conference & Exhibit will be held on September 11–15, 1961 in Los Angeles, California. The conference will be centered in the Biltmore Hotel, while the exhibit will be located in the Memorial Sports Arena in Exposition Park.

Over 20,000 personnel associated with instrumentation activities will attend this event which has for its theme, "Reliable Information from Undersea to Outerspace." Representative attendance will include engineers, scientists, technicians, management, educators, etc., from a broad array of industrial, military and educational operations.

The conference program consisting of technical paper presentations, forums, panels, workshops, clinics and plant tours will highlight the

(Continued on page 60)

Safety Code for Power Presses Revised

Elimination of hand or finger exposure in blanking, drawing and stamping operations of power presses is sought through application of a newly revised American Standard. Approved and published by the American Standards Association, *American Standard Safety Code for Power Presses, B11.1-1960* was developed by the 22-member B11 sectional committee over an eight-year period. The National Safety Council is administrative sponsor of this activity set up under ASA procedures.

The new standard provides for maximum safety procedures through the use of automatic or semi-automatic loading and unloading of dies, the limiting of any point-of-operation opening to a quarter of an inch or, if these methods are not possible, the installation of protective devices to control access to the point-of-operation.

The revised standard supersedes an American Standard approved in January, 1948, and applies only to those powered machines that shear, punch, form or assemble metal or any other material by means of tools or dies attached to plungers or slides. It does not apply to hot-metal presses, forging hammers or hot-bending presses.

Sections in the standard are devoted to definition of terms, requirements for press construction and installation, safeguarding at the point-of-operation, design, construction and setting of dies, inspection and operation. The appendix which elaborates on the material and specifications set forth in the standard was included to facilitate the standard's application in actual power press problems.

Concerning safety procedures at the point-of-operation, the standard specifies that each press be equipped and operated with a guard or protection device for every press operation performed unless the operation area is limited to an opening of a quarter-inch or less. The protective guards described include die-enclosure, fixed barrier or interlocked press-barrier guards.

Point-of-operation devices allowing operator access to the area for loading and unloading dies are to be designed and constructed so that it is impossible for the operator's hands or fingers to remain within the operation area during the downward movement of the slide. Devices specified in the standard for this purpose include adjustable press-barrier, gate or movable barrier, two-hand, pull-out, sweep and electronic control.

The B11 sectional committee is also developing a separate standard dealing with safety procedures for hand and foot power presses.

Copies of American Standard B11.1-1960 are available at $4.00 each from the American Standards Association, Incorporated, Dept P 241, 10 East 40th Street, New York 16, N. Y.

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Cleanliness Poster

An eye-catching new poster, urging industrial employees to "Wash Up—Stop Skin Trouble Before It Starts," has been produced by Industrial Division of the Association of American Soap and Glycerine Producers, Inc. The 14" x 17" poster, in three bright colors, uses a cartoon-style illustration of an employee happily washing up, to get its message across. It is part of the Soap Association's continuing campaign in industrial cleanliness, and was produced after an extensive survey revealed a startling lack of employee educational material in this vital area.

The Soap Association poster is available at 20¢ per copy on request to the Association's office, 295 Madison Avenue, New York 17, New York.

Other elements in the Association's campaign include a supervisor's flipchart, entitled "How We Can Clean Up Dermatitis," which is available at $10 per copy; a series of "Suds 'N' Duds" cartoon strips distributed free to house organ editors, plant doctors and hygienist; an authoritative guidebook, "The Prevention of Occupational Skin Diseases," written by Dr. Louis Schwartz and published by the Association; and a series of case history articles on successful dermatitis prevention programs carried on in different phases of industry. Further information on any of these materials can be obtained from the Association office.

AEC Reports On Radiation Problems

Two Atomic Energy Commission reports released through the Office of Technical Services, Business and Defense Services Administration, U.S. Department of Commerce, Washington 25, D. C., cover AEC-sponsored studies on protective clothing for workers exposed to radiation, and techniques for measuring certain radioactive lung health hazards. The reports are described below.

Evaluation of Plastic Films For Protective Suiting. A. E. Symonds,

Jr., Savannah River Laboratory for U.S. Atomic Energy Commission. November 1960. 18 pages. (Order DP-528 from OTS, U.S. Department of Commerce, Washington 25, D. C., 50 cents.) Results of a study of several films tested for use in protecting workers exposed to tritium are presented. The polymer films were evaluated by measuring their permeability characteristics and diffusion rates in relation to tritiated water vapor, and by measuring the retention and ease of removal of tritium activity.

Method of Calculating Lung Dose Received From a Confined Cloud of Radioactive Gas. Idaho Operations Office, U.S. Atomic Energy Commission. December 1960. 27 pages. (Order IDO-16632 from OTS, U.S. Department of Commerce, Washington 25, D. C., 50 cents.) Investigations of a method to determine the dose delivered to the lungs by a radioactive gas in a confining situation are summarized. The technique involves use of a film badge to measure the dose. A formula was devised whereby "the adjusted film badge reading" will reveal the concentration of the radioactive gas and the resulting lung dose can be readily computed.

Off-the-Job Safety

Family Recreation and Safety—1961, an 80-page guide to safe recreational activity, has been issued by New York University's Center for Safety Education. The digest-size booklet contains 18 articles describing effective precautions designed to contribute to the security of summer sportsmen and vacationing Americans. The articles range from the proper handling of fire arms to safety factors in skin and scuba diving.

In his introductory article, Dr. Walter A. Cutter, director of the NYU Center, notes that "every season, we become accustomed to reading about drownings, firearm accidents, and falls, while individuals were out 'having fun.' These tragedies seem all the worse because they happened while people were supposedly enjoying themselves. This magazine," he states, "written by men and women who 'know the score,' is prepared solely for the safety and well-being of the families of this country."

Included in the booklet are articles titled: "Water Skiing—Safely," "The ABC's of Gun Safety," "Organizing the Family Vacation Trip," "Do-it-Yourself Activities Around the Home," "Motor Boating with Built-in Safety," and "Camping by Car and Trailer." The last article, "Fitness—for Recreation," deals with physical, emotional, and social fitness as related to safety.

Copies of the booklet are available at $1 (or $.75 for ten or more) from the Center for Safety Education, Division of General Education, 4 Washington Square North, New York 3, N. Y.

The editors of "Family Recreation and Safety" state that the book will be especially valuable to industrial establishments interested in off-the-job safety of employees, as well as to safety educators, civic groups, and private individuals.

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(For details, use Key # J-8 on card on page 33)

The Puritan Chemical Co. recently was honored with a top safety award for its 1960 accident prevention record of operating a full year without a single disabling injury. The citation was presented to Edwin B. Feldman, vice president-engineering and production, by Employers Mutuals of Wausau, at ceremonies in Puritan's Atlanta plant. The company's unbroken string of accident-free hours began in January, 1960, continued through 287,328 man-hours that year, and was still intact through May, 1961. That management is safety conscious is evident in machine arrangement, safety devices—a blind man operates a Puritan punch press—and in all phases of the company's training program and sales procedures.

Said one Puritan executive: "Housekeeping is our business—and housekeeping and safety are inseparable. In neither case do we look upon it as a nuisance; it's just good business."

• • •

Employees in the Administration divisions of Aerojet-General Corporation's Sacramento Plants have scored a "Triple Crown" in national awards, as three times within a month they were selected for national honors in recreation, cafeteria feeding and safety.

Topping the list of prizes is the 1961 Helms Athletic Foundation Award for Industrial Recreation as Aerojet's Employee Recreation Center was judged to have the "outstanding industrial recreation program in North America."

Then came word that the huge modern cafeteria in Sacramento had been selected as the nation's No. 1 industrial facility during competition at the National Restaurant Show in Chicago.

The third national award came from the National Safety Council, citing Aerojet's Administration Divisions for the outstanding record of 3,000,000 man-hours without a disabling accident.

Aerojet's recreation program provides employees and their families with a wide variety of athletic, social and cultural activities, including such varied programs as judo, model railroading, prospecting, skin diving, dancing, dramatics, art classes, bridge and many others. A gymnasium, swimming and wading pools, tennis courts, ping pong tables, softball diamonds and picnic grounds are among the facilities available.

The recreation center is jointly governed by the company and its employees. The Aerojet program was judged to have the outstanding program for firms with more than 10,000 employees and also the top program for all classes.

The award to the cafeteria was enhanced by the novel "scramble system," in which there are no lines and employees move about as in a supermarket, allowing 6,000 people to eat in a two-hour period.

• • •

Employees of the Zanesville, Ohio plant of Columbia Cement Corp., a wholly-owned subsidiary of Pittsburgh Plate Glass Co., have been awarded nine safety citations for their safety performance last year. They qualified for the National Safety Council's "Award of Honor" by meeting rigid requirements established by the NSC's Award Plan. The Zanesville operation was cited because its 100% frequency and severity rates in 1960 were better than "PAR" rates. The PAR rates are computed from the plant's safety experience during 1957–59 and the frequency and severity rates of the nation's concrete products—ready mix industry.

In recognition of its perfect 1960 safety record the Zanesville plant's Jonathan Limestone Mine received the U. S. Bureau of Mines "Sentinels of Safety Trophy" which is awarded annually to the nonmetallic mine having the best safety record in nationwide competition. Employees of the cement and limestone mine operations had completed 698,930 accident-free manhours during 1960.

Additional safety awards presented to the Zanesville employees included the Certificate of Achievement by Manufacturing Chemists' Association; Portland Cement Association Award; Special Achievement Award, Safety Merit Certificate and 100% Accident Prevention Record Award by the Industrial Commission of Ohio; Group Safety Award by the Zanesville Industrial Safety Council; and Certificate of Honor by the Pittsburgh Plate Glass Company.

• • •

Two special awards were made to the Bestwall Gypsum Company of Grand Rapids, Michigan by Employers Mutuals of Wausau. One award was for completing the 1959 year without a single disabling injury; the other for operating during 1960 with only one disabling injury, which made the plant a third award winner. W. L. Wiggins, Lansing safety engineer for Employers Mutuals, presented the two awards to J. B. Moss, plant manager. "The fine records," said Wiggins, "were the result of an exceptionally fine accident prevention program and the excellent cooperation of everyone in the plant."

• • •

During the first half of 1961, Garlock Inc. of Palmyra (N. Y.) established the "finest safety record in the near 75 year history of the

company," according to a report issued by Safety Supervisor Everrett Merritt covering the six month period ending June 30.

Employees of the mechanical packing firm suffered only four lost time accidents at the Palmyra plant during this period. "This is a very favorable contrast to the 38 injuries resulting in lost time during the first six months of 1960," Merritt noted.

This represents a total of 1,705,000 production manhours worked by employees during this period. Actual loss of production time amounted to 44 days, compared with a loss of 452 days in the similar period last year.

• • •

The nation's gas utility industry improved its employee safety record in 1960 for the thirteenth consecutive year, according to an annual survey by the American Gas Association. By reducing accidents 4.1 percent, the industry continued to maintain the longest unbroken record of disabling injury reduction in U. S. industrial history.

Gas utilities, including pipeline companies, had an all-time low of 7.01 disabling injuries per million manhours last year. This is a reduction of 67.9 percent since 1947 when the post-World War II peak of 21.86 injuries per million manhours was reached.

The severity rate of 563 was the third lowest on record, according to the A.G.A. Accident Prevention Committee. The post-war peak of 1,277 was set in 1947 and the best mark on record is 462, in 1957. The report is based on returns from 554 companies which represent 92.7 percent of the gas industry's estimated 211,000 employees.

• • •

An Award of Honor plaque, highest citation issued by National Safety Council, has been received by Universal Oil Products Company. Personnel of the Des Plaines, Ill., laboratory and administrative divisions completed 8,236,044 manhours without a disabling accident. The eight-million-plus manhour record covers a period dating back to March, 1956.

Employee's Ideas

(from page 6)

areas. Safety switches were suggested so that if too much pressure is built up by an overspeeding pump, the power will be cut and the oil will not overflow.

The neighborhood service station can offer a place for suggestions, too. One in our New York division overcame a cause of severe leaks when a pump was inadvertently hit by a customer's car.

Even public safety signs are a subject for a safety idea. Workers coming into our Manhattan office building wanted to cross the street with greater safety. An employee suggested having a stop sign erected at the corner. The City of New York happily cooperated and installed one.

Several of the above suggestions have been from marketing department employees—men in the small storage plants, delivery men, office workers. This points up the fact that all hazards are not confined to the big factories and refineries. **All the ideas and suggestions are not in large installations.** Just as your safety appeal is aimed at everyone on the payroll, so, too, the suggestion program must reach all employees, whether they work in groups of thousands, in small installations, or alone on the road.

The Port of New York Authority suggestion system yields many safety ideas in their scattered operations. They, like so many of the rest of us, are concerned with safety both for the public and their employees. The list of ideas is long and varied. It includes ideas underground, on the ground, and in the air. Many deal with their vehicles resulting in safer transportation for both drivers and passengers. Of all their accepted ideas, 13 percent have safety as a primary benefit—and 18 percent if secondary benefits are included.

Don't Skuttle the Small Idea

For those whose main concern is for safety inside the plant or company installation, we must keep one fact in the front of our minds. No idea regarding safety can be re-

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jected out of hand, maybe just because it seems small and relatively insignificant. We cannot ignore or reject minor safety ideas, such as signs which warn employees of unsafe water in certain pipes. Usually the employee is encouraged by the recognition he receives for a small idea and will submit a better one the next time.

A machinist in the Ethyl Corporation had an accident when a disk flew off a high speed rotary hand sander. The company was about to scrap 25 of these tools when an employee, through the suggestion system, proposed a foolproof governor to limit the speed of the sander. This suggestion not only promoted safety, but saved the company money. Award—$900.

Accident Pre-Prevention

Many safety people devote considerable time and effort to preventing accidents before they happen. We have found our employees are very helpful in making suggestions along this line. Several ideas have been responsible for alarm systems to give warning of unsafe conditions. One suggestion resulted in an installation at our Chattanooga terminal to notify all in the area by a blinking light that a dangerous product was being loaded. The suggester, of course, recommended an explosion-proof fixture.

There are times when warning lights may not be seen too clearly, so one of our Everett refinery people suggested the installation of a siren to attract attention to a malfunctioning line.

Our Bayonne plant makes wax, which can cause serious burns. Consequently, men working around hot wax are constantly on the alert to suggest ways for preventing wax from spilling or igniting. The location of valves where they can be easily reached without a hand or an arm getting near hot wax are most acceptable safety suggestions.

Fire Ideas

The placing of fire extinguishers has also been the subject of suggestions. A plant drawing or model may indicate the location of fire extinguishers. But often the experience of the man in the area results in suggestions for better placement. One of these ideas paid off to the tune of $100.

Cooperation between suggestion and safety departments, then, is of primary importance. And this applies to publicity as well. One of our company districts was celebrating a safety record. The usual meeting, speeches, and plaque presentation were planned. Suddenly, someone in management noticed that the safety record was due in part to safety ideas of some of the employees. As a result, several suggestion awards were made at the ceremony. This was a capital way of tying the safety and suggestion programs together.

Publicize Your Awards

Many companies have safety magazines or feature safety in other employee communication media. But how many publicize safety ideas and the awards earned by these ideas in their magazines, newspapers, and bulletin boards?

Editors of company publications are often at a loss to find new material or a new slant. These editors should look to their suggestion system offices for interesting data about safety ideas and the men and women who submitted them.

Also we should not forget the many fine posters warning employees to be cautious and develop safe habits. Suggestion system operators can and do cooperate with safety people by using posters which ask for safety ideas.

The Sum-Up

Suggestion programs—safety programs. Many of the goals of these two functions are identical. A worthwhile suggestion system program encourages safety ideas. Asking for safety ideas produces them. They can be processed through the suggestion system channel, but this channel must lead directly to the safety department. With cooperation between these two vital functions, we can work to the mutual advantage of employer, employee, and the public.

From an address presented at the 30th Greater New York Safety Convention.

THE FIRE FRONT

Fire Prevention Week

A complete line of materials to promote the 1961 Fire Prevention Week is now available from the National Fire Protection Association, international sponsor of the October 8–14 event.

"Don't Give Fire a Place to Start" is the theme of the attention-getting two-color poster adapted from an actual fire scene which has been prepared by the non-profit fire-safety organization. The same message and illustration appear on a coloring sheet for children and a blotter designed for mailings.

An unusual new item is the printed piece, in convenient envelope stuffing size, which combines the story of Fire Prevention Week and the Chicago Fire.

Folders on a wide range of home, personal and on-the-job fire safety subjects are also available from the association.

A completely new one is "About Electricity." There are also "Facts About Fire" containing a wealth of information and figures on saving lives and preventing fires, and the popular Home Fire Safety Check List.

In addition to the press-on sticker for emergency telephone numbers, a new sticker is being offered which can be placed on workbenches, desks, tools and many other spots as a constant reminder that "Fires close plants . . . cut pay days."

June Losses Rise

Estimated fire losses in the United States during June amounted to $103,348,000, the National Board of Fire Underwriters has reported. This loss represents an increase of 24.8 percent over losses of $82,829,000 reported for June, 1960, and an increase of 11 percent over losses of $93,103,000 for May of this year, according to Lewis A. Vincent, NBFU's general manager. Losses for the first six months of 1961 now total $635,017,000, an increase of 10.6 percent from the first six months of 1960, when they amounted to $573,971,000. These estimated losses include an allowance for uninsured and unreported losses.

Materials for teaching children fire safety rules include Sparky inspection blanks, comic books and coloring books, as well as lapel tabs, films and the big Sparky pattern-poster.

For samples and information, write the Public Relations Dept., National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass.

How to Select Security Guards

Great care should be exercised in the selection of plant watchmen, warns the Detex Watchclock Corp. The company recommends that before hiring a new guard the following points be given consideration:

- **A very young man or extremely aged man should not be employed. A very young man, ordinarily, has not acquired judgment and a sense of responsibility. An extremely aged man is not likely to be alert nor to have the needed physical strength and endurance.**
- **He should be of average height and weight; that is, neither very fat nor thin, excessively short nor tall.**
- **The man should be in good physical condition. He does not need to be an athlete, but neither should he have a heart condition or other physical ailment which might work to his disadvantage in moments of stress.**
- **The guard should have a high school education or its equivalent.**
- **He should be a citizen of this country.**
- **He should have no police record and be of good character.**
- **His maximum age for active service, ordinarily, should not be more than 60, although this age limit may be exceeded in exceptional cases.**
- **He should not be a heavy smoker or drinker. Under no circumstances employ a man who cannot restrain himself from smoking while making his rounds. Intoxication on duty should result in instant dismissal.**
- **A new guard should be placed on probation for a period of about six months.**

Helicopter Crash Fires

Each helicopter crash involving fire costs one life.

This startling figure was reported at the aviation seminar which opened the week-long annual conference of the National Fire Protection Association. The reporter was Captain Cecil H. Grimes, crash injury analyst for the U. S. Army, who contrasted this typical result of helicopter crash fires with accidents in which fire is not a factor.

When no fire results from a 'copter crash, he said, there is on the average only one fatality in every 22 accidents.

These figures, from Army investigation of helicopter accidents, "reveal the seriousness of fire in

the helicopter accident," Captain Grimes declared. "The situation is extremely alarming when we consider the injuries involved."

The studies show that 63 percent of all fatalities in 'copter accidents occurred when fire followed the crash.

In calling for an urgent program of designing and building more crash fire safety into helicopters, he labelled the problem especially critical because of the bigger 'copters now going into service. "The percent of fire accidents to total accidents is at an increasing rate as the models increase in size." The need for improvement is underscored by the fact that the Army will increase its 'copter fleet by two and one half times in the next 9 years, according to present plans.

Army studies indicate that in more than three-quarters of all helicopter fire accidents, it is ruptured fuel tank or line which starts the fire. Engine malfunctions account for most of the rest.

The particular problem of the helicopter, Captain Grimes said, is that the craft "does not have a suitable in-flight escape system when there is engine failure or other malfunction." The pilot, crew and passengers are committed to ride the aircraft "down" into what may be a crash landing.

One urgently needed improvement is a safer location of fuel tanks, and crash resistant fuel tanks—perhaps of rubber fabric which would resist rupture.

Fuel tank design and location is increasingly important, because today's bigger 'copters and their turbine engines call for much larger fuel loads, he said. Another new problem may come from the use of JP-4 fuel, which under most operating conditions is more combustible than either gasoline or kerosene.

Captain Grimes told the NFPA session that "the Army recognizes the fire problem in helicopters and is attempting to minimize the dangers involved. This will not be accomplished overnight, nor will it be solved alone. Only through the cooperation of all interested agencies and continued effort will the crash-fire hazard in helicopter operations be reduced to a negligible factor."

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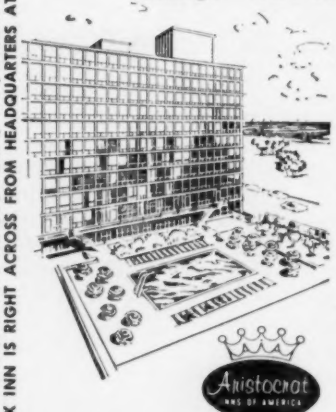

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Flammable Clothing

Clothing fires will continue killing people until legislation and education solve the problem. This was the warning issued at the National Fire Protection Association's 65th annual conference.

About one thousand lives are lost yearly in clothing fires, and uncounted thousands more injured and disfigured, according to Louis Segal, chemist for the California State Fire Marshal's office.

Segal said that while children and the elderly are frequent victims, "the only certain non-victims of clothing fires are people who don't wear any clothes."

While the infamous "torch sweaters" of several years ago have been legislated out of existence, there are still many types of fibers, fabrics and clothing designs which mean fire hazard for the wearer.

He described cotton and rayon as the most flammable of all the fibers, with wool approaching the ideal from the standpoint of clothing fire safety. The synthetics are quite flame resistant, or only moderately flammable.

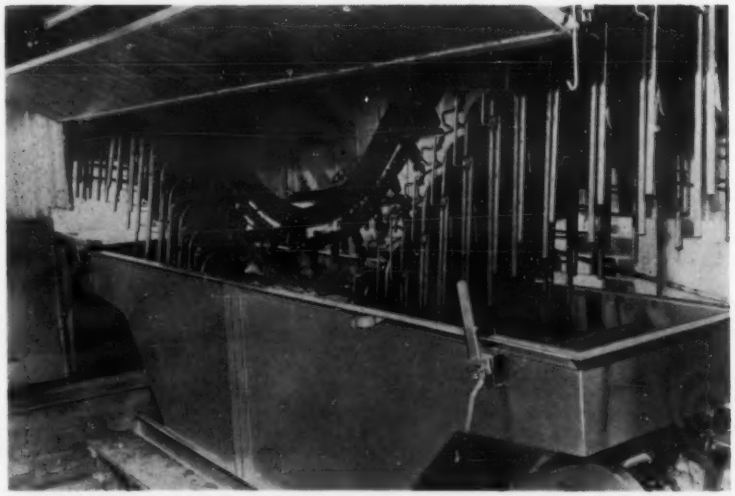
However, many other factors determine the hazard to the wearer—whether the fabric made from these fibers is light or heavy, loose- or close-woven, smooth or with a fuzzy, brushed surface.

Clothing design is important too, said Segal. Most clothing fire victims are women, partly because their clothing with wide skirts several inches off the floor and sometimes loose sleeves is a garment far more vulnerable to fire than is most men's clothing.

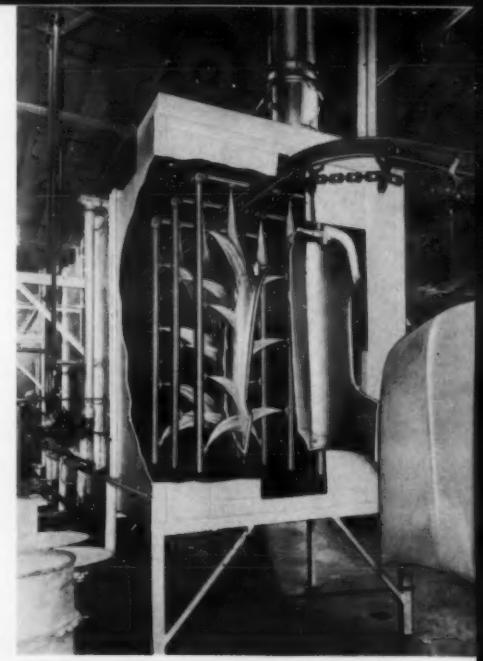
Improved Federal and state legislation to control fabrics used in clothing is needed to make progress on this problem, Segal declared, and better tests and standards as well.

However, in his opinion the basic solution is to educate people.

Ideally, people should know enough about the most flammable fabrics and designs to avoid them. But, concluded Segal, it would be substantial progress if people simply recognized that their clothing can burn and accordingly kept a respectful distance from sources of ignition.



DIP TANK



FLOW COATER

TAME THE FIRE HAZARDS OF PAINTING - Pt. 2

Dip Tanks • Flow Coating • Roller Coating

In Part 1 of this article, published in the July issue, the author discussed methods of preventing fires and explosions in paint spray booths, including booth location and construction, illumination, ventilation, electrostatic apparatus, operation, and static electricity. In this concluding installment, he outlines fire prevention techniques for other methods of paint application.

by **FRANK R. PITT**
The DeVilbis Co.
Toledo, Ohio

DIP TANKS

NFPA Code 34 contains the standard requirements for dip tanks, and we again see that the fundamental requirements for safety are the same as for spray booths as described in the August issue: adequate ventilation and the elimination of sources of ignition will eliminate most fires and explosions. We have one new factor of major importance, however, and that is the proper installation and protection of large tanks full of flammable solvents. Wisdom dictates that low boiling solvents should not be used if suitable ones with a higher flash point can be used, as better vapor control can be established. Water emulsions are increasingly being used for this reason. By the same token, if heat is used to maintain uniform viscosity during cold weather, care must be exercised not to overheat, as this will lower the flash point and increase the vapor hazard.

Ventilation

Chapter 3 of Code 34 requires the atmosphere around the dip tank and any drain-off areas to be kept below the lowest explosive limits. No specific rates of exhaust are given, as in the case of spray booths, because the relevant factors are so varied.

- **flash point of the solvents used**
- **surface area of the dip tank**
- **rate of speed for processing the parts to be dipped**
- **size of the parts**
- **length of drain-off area**
- **proximity to drying ovens**
- **use of detearing equipment.**

Suffice it to say the atmosphere

should be maintained so that the vapor concentration should not exceed 25 percent of the lowest explosive limits.

It is quite easy to measure the atmosphere around a dip tank installation with an explosion-meter. An interlock between a dipping conveyor system and ventilating fan is a further necessary safeguard.

Location and Construction

The location of dip tanks and drain boards is important. Code 34 provides that they should preferably be located above grade in a detached portion of a building that has at least a two-hour fire resistance rating, and the floor around the tank should be waterproofed, curbed and drained so that any overflow will be adequately and promptly removed to a safe place. Many dipping installations involving conveyors have both the dip tank and drain boards totally enclosed because this prevents the dispersion of flammable vapors and enables the proper rate of ventilation to be maintained. Overflow pipes should be installed to prevent the contents of the tank from spilling over, either through failure to regulate the input into the tank or through the release of water in the event of fire. Sec. 405 recommends:

Size of Tank	Diameter of Overflow Pipe
75–150 gallons	4″
150–225 gallons	5″
225–325 gallons	6″

The pipes should be installed at least 6″ from the top of the tank and should be kept clean; multiple outlets are preferable to only one.

The tank must be well constructed, be at least 6″ above the floor and adequately supported. The drain boards should be arranged so that if the sprinkler system operates, they will be disconnected from the tank to prevent water from channeling back and resulting in a flood.

To remove the flammable contents of the dip tank, an automatic quick drain is recommended for all stationary tanks, and it is mandatory to do so if the tank exceeds 500 gallons. The drain, which must be of adequate diameter, should be connected with a salvage tank of at least 25 percent greater capacity with a pump connection, and properly equipped with vents having flame arresters. The overflow lines can also be connected with this salvage tank. Don't use the salvage tank for storage.

The manual "Quick Release" should be located at a safe distance from the tank to assure its operation if flame or explosion occurs at the tank, and the automatic release doesn't function.

Automatic Extinguishing Facilities

An automatic cover attached to a fusible link and arranged to close tightly over the tank in event of fire, is one of the most efficient extinguishing devices. Of course, the covers should be closed whenever the tanks are not in use.

In addition, the proper type of extinguisher should be employed, and in some cases, a combination of extinguishing equipment will be suggested. Water is generally satisfactory if adequate drains and overflow protection are provided. Foam or carbon dioxide may also be used where operating conditions make these forms of protection preferable to water. Be sure to use the right type of foam and see that foam will not plug up the overflow drains, or drain off too quickly. The use of an L shaped connection pointing downward from the end of the drain access will largely prevent the loss of foam protection. The automatic stoppage of the ventilating fan will assure proper operation of a carbon dioxide system.

Sources of Ignition

The same sources of ignition for spray booths are found around dip tanks and drain boards; and the same precautions and controls are necessary. Let me emphasize that because flammable vapors from most finishing materials are heavier than air, and the opportunity for release of such vapors is probably easier than from spray booths, such vapors must be exhausted promptly and completely so they will not migrate to distant locations where sources of ignition exist. Often, a downdraft exhaust around the base of the tank can supplement the main means of ventilation, or be the sole method of ventilation. Where hand dipping is being done, updraft ventilation is not recommended because the fumes and vapors will be carried across the breathing zone of the operator.

FLOW-COATING

The third major method of applying industrial finishes is flow-coating. The equipment has three major sections:

1. A vestibule to prevent the escape of flammable vapors from the entrance of the system. This is accomplished by having the entire system under negative pressure, and also by installing fans inside the entrance to augment the inward flow of air into the vestibule to establish an efficient air seal.

2. The flowing or painting section where paint is flooded over the object at pressures of less than 10 p.s.i., from multiple nozzles positioned at various angles to give complete coverage. The excess paint is drained into a sump or collection tank, and re-circulated after being strained and refortified with sufficient solvent for proper flow out.

3. The drip or drain off section is the longest part of the unit, and serves the same function as the drain board section of a dip tank installation. However, the atmosphere is controlled to assure a sufficiently solvent-laden atmosphere that will result in uniform, proper drain-off, under controlled safety conditions. Air seals are provided by keeping the drain-off area under negative pressure.

Obviously, this method has characteristics of both spraying (Section 2) and dipping (Sections 1 and 3) and all of the fundamentals discussed previously must be observed in this process: Adequate ventilation, isolation from flame and sparks or high temperatures, scrupulous good housekeeping, and of course, properly designed equipment and protection.

The following special rules are merely modifications of those already considered.

Ventilation

1. Positive mechanical ventilation should be supplied at the rate of 10,000 c.f.m. of fresh air at 70°F.

for each gallon of solvent evaporated within the unit.

2. The ventilation must be balanced so that flammable vapor concentrations shall be kept below 25 percent of the lowest explosive limits of the solvent being used within two feet of the flooding and drip areas, and the freshly coated work. This standard is sometimes difficult to meet for production reasons. A higher concentration up to 50 percent of l.e.l. may be permitted if approved gas sampling vapor indicators are used with an automatic shut-off of the paint supply system when the concentration reaches 60 percent of l.e.l.

3. Solvent vapors, being heavier than air, should be exhausted along the drain tunnel through slide dampers positioned about 2 feet above the floor.

Electrical Equipment

The rules are short and to the point:

1. **Keep electrical devices out of the flow-coat unit.**
2. **Use explosion-proof or vapor-proof equipment as required by the local inspection authority.**

Maintenance

1. Every day, flush down with solvent the floors, drain boards and walls of the system to prevent accumulation of drippings and eventually save maintenance costs. The solvent will not be lost but drained back into the solvent storage tank. As additional solvent is required to maintain proper viscosity of the material coming from the material tank, this reclaimed solvent will be blended with the material, generally automatically.

2. Don't wear rubber soled shoes when cleaning as static electricity may ignite vapors, and do use non-sparking cleaning tools.

3. If leaks develop in the tunnels or the piping, don't do any welding or cutting until all flammable materials have been removed and the atmosphere purged of vapors. 29 percent of dip tank and flow-coat fires were caused by these operations in the sample test period of 1940 to 1952.

(Continued on page 59)

CHARLESTON CHARCO RUBBER CO.

DEPENDABLE HAND PROTECTION

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CHARLESTON RUBBER COMPANY

Servant of Safety — Master of Quality

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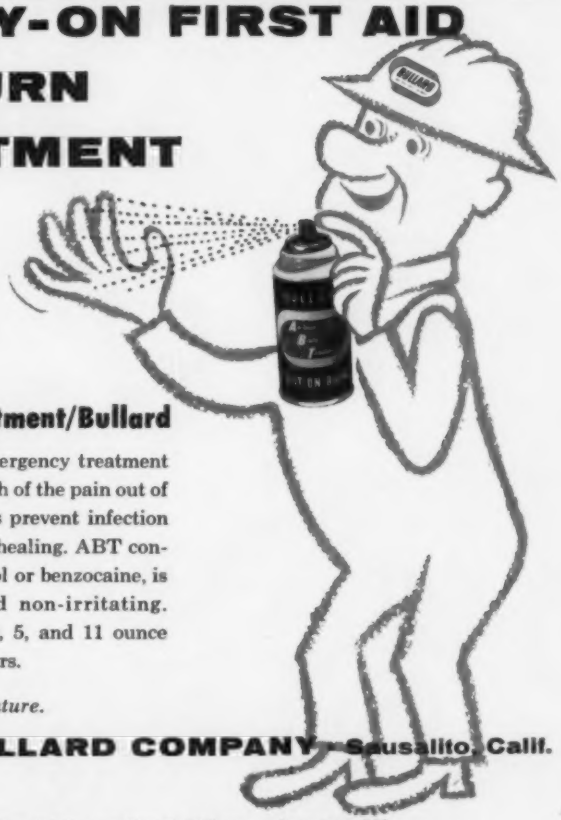
(For details, use Key # J-13 on card on page 33)

SPRAY-ON FIRST AID BURN TREATMENT



Aerosol Burn Treatment/Bullard

ABT is an emergency treatment that takes much of the pain out of burns. It helps prevent infection and promotes healing. ABT contains no alcohol or benzocaine, is non-toxic and non-irritating. Packaged in 3, 5, and 11 ounce spray containers.

Write for literature.

E. D. BULLARD COMPANY — Sausalito, Calif.

(For details, use Key # J-14 on card on page 33)

This Good Escape Program Saved Lives

A fire at the LaCrosse (Wisconsin) Lutheran Hospital on February 2, 1961 was discovered by a practical nurse who heard a crackling sound in the floor corridor of the old section. She opened a cupboard door and saw flames inside the cabinet. She immediately closed the door and set off a nearby fire alarm connected to the fire department.

From the cabinet the fire spread vertically through open ducts and pipes to the fourth story and roof. The loss was approximately $400,000. The hospital is five stories high with a basement. The hospital housed 245 patients at the time of the fire.

There was immediate response by the fire department and a well planned and rehearsed hospital emergency program prevented injury and loss of life—and panic! At the sounding of the alarm gong, hospital personnel started moving 45 patients out of the involved old section to the halls of the end wings of the building. As soon as the old section was evacuated, the doors in the hallway between the old and the new sections were closed.

Due to smoke infiltration, the 1927 and 1917 sections were cleared of 76 patients by moving them to the halls of the end wings. All these patients were then taken to the lower floors and moved to the nurses home and the adjoining Gunderson Clinic.

Ambulances took 25 patients to other LaCrosse hospitals where emergency receiving procedures had been made ready, and private cars took another 100 patients out of the hospital. Patient movement to areas of safety on the premises was accomplished in about 15 minutes and further movement of those who were sent to other hospitals, or to their homes, was completed less than an hour later. Within the hospital premises, patients were moved where necessary by wheel chair, by stretcher, by rolling beds, or by mattress or blanket carrying. The majority moved under their own power. All patient movement was accomplished or supervised by hospital personnel and aided by emergency help from the city police and fire department.

✓ Fire Protection SERIES

Other Articles: October and November

Is Your

by **CLAUDE C. STUBBE**
Chief Engineer
Mutual Service Insurance Cos.
St. Paul, Minn.

Preparation of an excellent fire emergency program and fire drills in applying the plan made possible the trouble-free, orderly evacuation of patients described at left. Too much emphasis cannot be placed on the value of the program in this fire and for the vital need of a similar program in all institutions, in factories, or in any type of business enterprise.

Did this nurse, when she pushed the fire alarm, push the panic button? Obviously, she did not. There was orderly evacuation. There is no magic to this, nothing technical, nor does it cost a lot of money.

No matter the type of business, you must prepare, for some day it may happen to you. Prepared, you can have the same good feeling that management of this hospital had when all the patients were successfully evacuated.

If you are not prepared, if the fire destroys your building and there is loss of life, you stand indicted for mismanagement and for not having taken the proper precaution of saving the lives of your employees.

What type of buildings occupied by people should have building evacuation programs? Should they be factories? Should they be food processing plants? Should they be one story buildings? In one story buildings, one could say there is no need for a planned program. Should it include small shops and stores? All these buildings need a plan. Do families living in apartments or in their own homes have a plan to get out in case of fire? Or will we read in the morning news of families lost in a fire?

How do you set up an evacuation program? Start with the man who has been designated as the

Fire Alarm a Panic Button?

building fire chief, fire prevention engineer, chief fire warden or fire captain. Whatever his title, he is the man that management has put in charge of fire prevention and control.

For the sake of terminology, let's call him the director of fire prevention and control. It's his job to set up the evacuation program. He may have to burn a little midnight oil to get it shaped up the way he wants it.

First he goes to management to discuss the proposed plan and to have them okay it. It is not always easy to get management to go along, especially if it is going to cost a few dollars. So you take on the job of a salesman and you had better be a good one.

Let's say a manager has okayed the plan even though it costs some money. He has told the Director of Fire Prevention to go ahead and get it organized as soon as possible. He's one of the few managers who believes in real fire prevention and building evacuation.

Duties of the Fire Director

What are some of the necessary things that the Director of Fire Prevention must do? In a large building he certainly would want a fire alarm system. (Figure 1) The purpose of the alarm system is primarily to warn people in the building that something is wrong—a fire! The fire alarm also informs the company fire fighting group, if there is one, and then it informs the fire department of the city. You may have a mechanical system such as a bell or the more up-to-date push-button type.

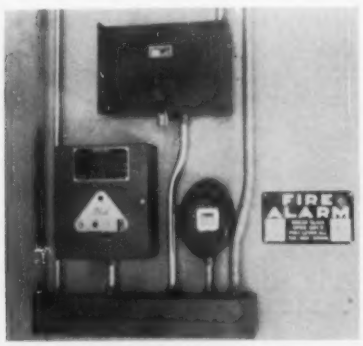


Fig. 1 Fire alarm warns employees.

Keep in mind that our plan is to set up an evacuation route so that people can leave the building quickly and safely. The proper marking of "Exits" is one of the biggest chores we have on this job. (Figure 2) In too many cases, people seem to think it's not necessary. But too many people have lost their lives because they did not know where to go.

Fig. 2 Exit signs show escape route.

Exit lights should be on during the entire day and night, twenty-four hours of the day, never ceasing. One problem is getting plant protection engineers to put in a good strong bulb. Most of them want to use just a little 25 watt bulb, probably because they think they are going to save some electricity. Put in a good light: 50-, 75-, 100-watt. Should there be a sudden blast of fire and smoke, you will need to see the Exit sign. Never get the idea Exit signs are not needed. There may be customers in your building, visitors, new employees who need to know the way out.

Fig. 3 Keep aisles clear.

Aisles—to keep them clear is a big job. Don't say that this is the responsibility of the warehouse men or janitors. It's the fire director's job to see that aisles are not cluttered and are kept clear of storage. (Figure 3) In case the alarm sounds, it's the job of the fork lift operator to get his machine out of the way, not only for the sake of personnel, but also for the firemen. One machine operator asked me about running it out of the building. That's fine if you are on the ground floor and you can be sure that the escape route for people is not held up or endangered.

Stairways should also be kept clear. They should not be used for

Fig. 4 Keep stairs clear, provide hand rails.

Fig. 5 This photograph shows panic hardware installed on emergency door.

storage. They are for one purpose only and that is free passage up or down.

They must be clear, especially in case of fire. Provide hand rails, on both sides. (Figure 4) Some of your people may not be so spry and need something to hang on to. For safety, all of us should use the hand rail, particularly in case of fire.

Take this up in your fire drill; all must adhere to the rule "Use the Hand Rail." Don't forget adequate lighting.

Panic hardware must be provided for the outside door. (Figure 5) Over the years hundreds and hundreds of people have lost their lives because doors opened in, or, if they did open out, were not provided with panic hardware.

Fire Escapes

Suppose the inside stairway is blocked with fire and smoke. You then have to resort to the outside fire escaper . . . and here are some real problems. You have checked the strength of the fire escape and it is in good condition. It is anchored properly. But you realize that it's a dizzy height for some people, especially women (Figure 6) and you know you are going to have trouble evacuating everyone.

Fig. 9 Switchboard operator must be person who can remain calm in a crisis.

Let's look at some fire escape problems. I have experienced a few bad ones. The first happened to be a drill. It would have been tragic if there had been a real fire. The first lady who stepped on the fire escape platform got frightened,

(Continued on page 37)

FIRE ESCAPE PROBLEMS

Fig. 6 High fire escapes make some people dizzy.

(ABOVE) Fig. 7 Women's spike heels are a safety problem on gratings.

(BELOW) Fig. 8 Swing sections of fire escapes must operate freely.

LOSS STOPPERS

The free bulletins and catalogs reviewed below are offered by the Reader Service Department of this publication. To obtain copies without cost or obligation, write in the key numbers on the Reader's Inquiry Card.

INDUSTRIAL HYGIENE

Automatic Bag-Type Dust Arresters 317
Northern Blower Div., Buell Engineering Co. This 8-page brochure covers bag-type dust arresters that collect dust without interruption during bag cleaning. Gives design and assembly data; tells how unit works; tabulizes dimensions and capacities. Also includes data on pneumatic and electric operation, rotary discharge valves, continuous screw conveyors, bag bands, and exhaust fans.

Radioactivity Measuring Instruments 318
Nuclear-Chicago Corp. A new 60-page catalog describes more than 250 instruments, counting systems, radionuclides, and nuclear accessories. Nearly half covers new products such as manual and automatic liquid scintillation detectors, laboratory monitors, radioactivity training systems, personnel protection devices, etc.

Soap-Dispensing Systems 319
Puritan Chemical Co. Data sheets impartially evaluate soap dispensing systems for washrooms, including powdered soap, liquids, lather, and cake soap systems. Give results of usage tests and suggestions for mounting, operation, and care of soap dispensers.

Filter Dust Collectors 320
The Day Co. 8-page bulletin describes and illustrates with pictures and diagrams the uses and applications for dust collectors utilizing fabric filter sleeves. Lists wide range of applications; features reverse-flow design; and gives specifications for various models.

Noise Meters and Analyzers 321
H. H. Scott, Inc. A short form catalog features a complete line of sound measuring and analyzing instruments, industrial amplifiers, speakers and FM tuners. Also contains data on multiplex adapters and test equipment.

Floating First Aid Kit 322
Otis Clapp & Sons, Inc. Illustrated bulletin describes a water-tight, floating first aid kit for marine use. In addition to first aid items for sunburn, cuts, bruises, chapped skin, headache, fainting, toothache, eyestrain, etc., the kit also contains a fluorescent-orange flag for distress signaling.

Dry-Type Unit Filter 323
American Air Filter Co. New, lightweight, unit-type filter for high efficiency and low resistance is described in this bulletin, which outlines its uses, construction, installation, operation and frame arrangements. Bulletin lists six advantages of this inflating type filter for ventilation systems.

PERSONAL PROTECTION

Interchangeable Filter Respirators 324
Mine Safety Appliances Co. 4-page illustrated bulletin shows how one facepiece can be used with a variety of filters for protection against dust and fumes and chemical cartridges for protection against gases. Includes a guide to the selection of the correct filter for different types of dust and fume hazards.

Protective Clothing for Liquid Oxygen 325
Standard Safety Equipment Co. A line of protective clothing made of polyvinyl chloride as a safeguard against liquid oxygen is described and illustrated in this bulletin. Includes coveralls, hood with acetate window, gloves, and booties for wear over safety shoes.

Chemical Glove Guide 326
B. F. Goodrich Industrial Products Co. A guide to the selection of industrial gloves for handling nearly 400 different chemicals features this new 8-page catalog. Includes a performance chart which rates the comparative wear and chemical resistance of neoprene, neoprene-coated, Koroseal-coated and rubber gloves. Also data on 16 BFG gloves.

MAINTENANCE

Pourable Sealing Compound 327
The Monroe Co., Inc. Catalog sheet describes and illustrates the advantages and uses of a ready-to-use sealing compound for interior and exterior application to seal cracks and expansion joints. It shows that no heating of product is required and how it resists temperature extremes.

Mastic Flooring 328
American Bitumuls & Asphalt Co. Installation features and advantages of an industrial mastic flooring and underlayment product are outlined in a 6-page bulletin. Highlight is an illustrated discussion of methods of application. Photos show typical installations.

(Continued on the next page)

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Loss Stoppers (Cont'd)

High Quality Concrete 329
Master Builders Co. Nine factors governing high quality concrete production are discussed in this 6-page bulletin: flexural, bond and compressive strength; workability and durability; entrained air; shrinkage; permeability; resistance to scaling. Includes charts, graphs and photos based on field and lab tests.

79 Uses for Vacuums 330
Breuer Electric Mfg. Co. This handbook offers 79 cost-cutting ideas for curing housekeeping headaches by means of industrial vacuums. Shows how to rate your cleaning efficiency, how to do maintenance work more easily. Includes boiler cleaning, recovering valuable waste, electrical cleaning, contaminated air cleaning, wet pick-up.

FIRE PROTECTION

Signaling Horns 331
Frederic B. Stevens, Inc., Clark-Cooper Div. A 16-page brochure offers data on a complete line of air horns, steam horns, and accessories. Pictures show industrial applications. Gives directions for determining the type and number of horns needed for a given area.

High Pressure Fog 332
John Bean Div. The effectiveness of high pressure fog is featured in this 16-page catalog which gives complete specifications and performance data on in-plant, high pressure fog units, including stationary, mobile and skid-mounted equipment.

MISCELLANEOUS

Circular Saw Guard 333
Brett-Guard Corp. A 6-page illustrated booklet and a special wall chart describe a safety tool that serves as both a guard and guide for rip saws, including many operations that have been difficult to guard effectively. Also includes data on a free loan sound film on saw safety.

Emergency Light Specifications . 334
Electric Cord Co. Engineering specifications for a battery-operated emergency lighting unit covers operation, battery, charging operation and control, lamps, safety equipment, cabinet, approval and guarantee.

What's Your Problem?

- **Has an accident or fire interrupted production?**
- **Want to know how to prevent it?**
- **Do you need background information on equipment for industrial safety, hygiene, or maintenance?**

As a service to its readers, this publication will arrange to supply manufacturers' literature on the following subjects. Just insert the key number on the Readers Inquiry Card on the preceding page and be sure to fill in your name and address. If you need information on a specific type of product, simply write it in on the Inquiry Card.

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102	Face Shields
103	Lens Cleaning & Anti-Fogging Equipment
104	Sweat Band
105	Hard Hats
106	Respirators & Masks
107	Protective Clothing
108	Women's Protective Caps
109	Safety Belts
110	Safety Gloves
111	Electrical Gloves Tester
114	Welding Helmets
115	Fire Fighting Suits
117	Safety Shoes
	FIRST AID AND HYGIENE
120	Protective Skin Creams
122	Sanitary Drinking Facilities
124	Salt Tablets
125	Resuscitators
126	Antiseptic Medication
127	Burn Medication
127A	Poison Ivy Immunizer
127B	Poison Ivy Medication
128	First Aid Kits & Supplies
129	Stretchers & Litters
129A	Stretcher Cases
130	Throat Medication
131	Eye Wash Fountains
131A	Emergency Showers
132	Portable Ventilators
133	Dust Collectors
135	Hearing Protectors
137	Noise Mufflers (machines)
	FIRE PROTECTION
141	Safety Cans
142	Fire Alarms
148	Watchmen's Control System
149	Fire Blankets

Key Number	Subject
	LIGHTING AND WARNING DEVICES
150	Alarms & Warning Lights
153	Fluorescent Lamp Guards
154	Emergency Lights
155	Truck Back-Up Alarms
	MAINTENANCE
161	Anti-Slip Waxes & Finishes
162	Floor Cleaning Compounds
163	Floor Cleaning Machines
164	Floor Resurfacing Compounds
165	Oil Absorbents
168	Ultrasonic Flaw-Detector
	LADDERS & HANDLING
170	Ladders
171	Ladder Safety Devices
172	Scaffolds
173	Work Platforms
174	Emergency Ladder Rungs
175	Safety Hooks
176	Folding Truck Steps
177	Carboy Pumps
	GUARDS
178	Machine Guards
179	Power Press Feeders
180	Safety Tools
181	Vacuum Sheet Lifters
182	Valve Operators
184	Safety Lock-Outs
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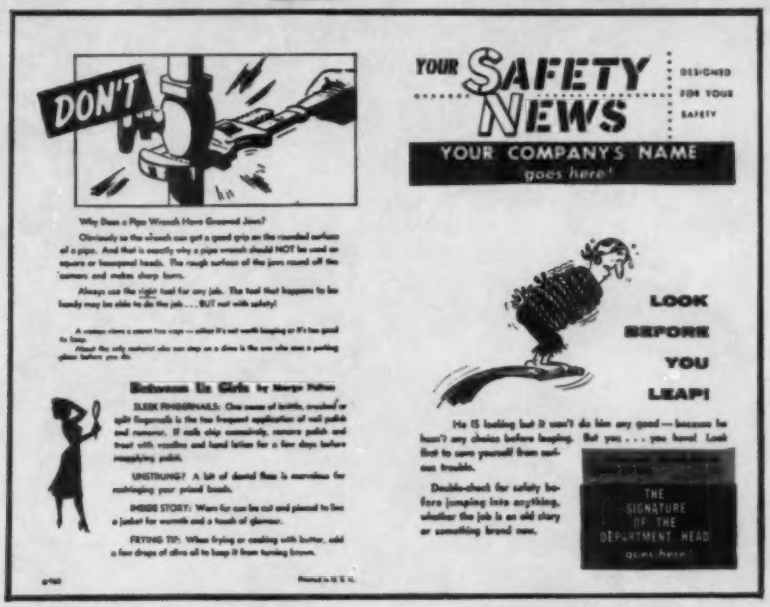
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BEST'S

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Fig. 10 Designate person to use street fire box, too.

Fire Alarm
(from page 32)

stood at the head of the fire escape and could not move, and the people behind her could not, of course, move either.

Another problem—spike heels on the ladies' shoes do not work too well on fire escape gratings. (Figure 7) One lady caught the heel of her shoe, fell and broke an ankle. This type of thing could cost the lives of several people in a real emergency.

There are problems of snow and ice in the north temperate zone. Snow and ice can build up on an outside fire escape despite the open grating type of structure.

Sometimes janitors or maintenance men will tie the lower counter weighted section when they see it swing a little. Fire people must see that the lower swing section operates freely. Usually one of the designated fire wardens or assistants immediately goes to his station at the bottom of the fire escape to get the swing section down. (Figure 8) Women will not go out on it to weight it down.

The Fire Call

The Fire Call is important regardless of who is doing the job. Certainly your fire alarm is warning everyone on the premises, but many firms have alarms that are not connected with the fire station. In such cases, it may become the duty of an operator at a switch-

Evacuation Program Check List

The Fire Director must make certain:

(1) that there is some type of alarm system;

(2) that the switchboard operator immediately calls the fire department;

(3) that exit lights show the way out;

(4) that stairways have hand rails and are clear of material storage;

(5) that there is panic hardware on the doors and that outside exit doors are properly marked;

(6) that certain employees have been designated to take care of customers or visitors in building;

(7) that woolen blankets and first aid kits have been provided and that someone knows how to give first aid for injuries and burns;

(8) that flash lights have been provided for each floor or you may find yourselves in complete darkness;

(9) that first aid fire fighting equipment has been put into use;

(10) that there are at least two other escape routes in case the one you are going down is blocked by fire;

(11) that all power has been cut;

(12) that someone has been designated to go to the street fire alarm box—do not wait to see if the other call went through—three calls are 100% better than none;

(13) that fire protection and fire control plans have been frequently reviewed;

(14) that everyone leaves the building during a drill. Insist on all executives leaving the building the same as employees when you have a drill.

board to notify the fire department. (Figure 9) It is important that this girl can think clearly about what she is to do and say. Excited girls often garble the tones and close the switch before the fire department can ask them where the fire is located.

Therefore, in training the personnel for this job, select a switchboard operator who can remain calm. She must give the fire call and state where it is located in a clear tone of voice. She must also repeat it to make sure the fire alarm has been received.

Suppose there is a flash explosion and that your communications center is disrupted. What are you to do? Some person must be designated and trained to go to the street fire alarm box. (Figure 10) Does he know where it is? Don't be surprised when you find that most people have no idea where the nearest fire alarm box is located.

The record on fire calls is bad. Many a building burned to the ground because (1) the fire call was delayed; (2) the fire department was unable to understand where the call was from or what the address was; (3) the people involved in the fire thought someone else had sent in the call.

The alarm must be sent in by someone designated for the purpose. This person must not wait to see if your own personnel can put the fire out, but must put the call in, immediately. This is necessary for the protection of human lives, especially if the fire department may have to use their hook and ladder for rescue work.

Fig. 11 Getting people out of building fast is an aid to fire departments.

How Fast?

When the people are on their way down the fire escape, speed is essential but not to the point that it makes for bad egress. Men should be placed at a reasonable spacing to see that the women keep moving at a good sound speed that will not bring about an accident.

From 120 to 130 paces per minute is a good speed while walking to the fire escape. Anything faster could cause an accident. Naturally when going down the fire escape, caution must be exercised so that no one will fall and block the way down. When all people are out of the building, the people in charge of first aid should immediately go to the aid of those who are hurt or burned.

Drills must be held if the employees are to know exactly what they should do at the time of fire or other emergency. It cannot be emphasized too strongly that **good fire drills will assure orderly exit under control and prevent panic.** The lack of a fire drill and a building evacuation program has been responsible for most of the loss of life in the major fire disasters of history.

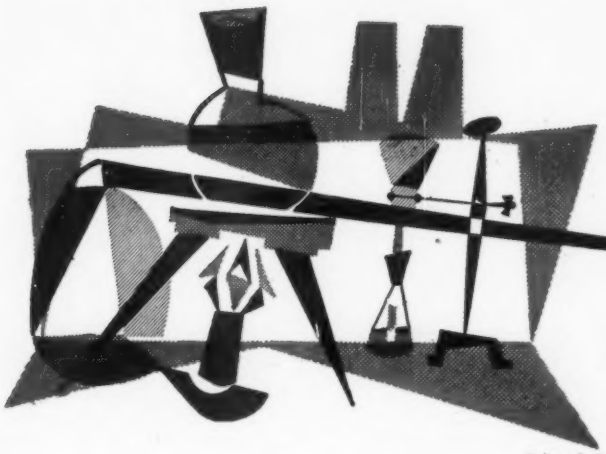
When you organize your plant for fire prevention and control, it usually encompasses more than just building evacuation. However, let me point out that, in every instance, the responsibility for fire prevention and control rests primarily with management. It is the duty of management to establish whatever means are necessary to protect the human lives and property that come under their jurisdiction.

Fig. 12 No building is "fireproof."

Fire Organization

Management usually appoints the Director of Fire Prevention and Control to be in full charge. The Director should appoint a committee to assist him. He may appoint one for each floor or one for each section or department. The size of the organization will govern how many are required. Fire Captains should be appointed to be in charge on each floor, section or department. Committee members and

(Continued on page 51)



industrial hygiene

Edited By
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Author of
"Manual of Industrial Hygiene and Toxicology"
"Manual of Methods of Air Pollution Control"
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Member of
American Industrial Hygiene Association, N. Y.
Fellow American Institute of Chemists
American Chemical Society
American Academy of Forensic Sciences (Toxicology Section)

Events of Interest to Industrial Hygienists

October	Event
25–26	*Industrial Hygiene Foundation:* 26th Annual Meeting; Mellon Institute, Pittsburgh, Pennsylvania
November	
1–3	*Industrial Engineering & Management Clinic:* 25th Anniversary; Industrial Management Society, Pickwick Congress Hotel, Chicago, Illinois
6–7	*Symposium on Meteorological Air Pollution:* U. S. Public Health Service Division of Air Pollution, Cincinnati, Ohio
8–11	*Institute of Management Sciences:* 2nd Annual Meeting (Joint with Operations Research Society of America), Jack Tar Hotel, San Francisco, California
13–17	*American Public Health Association:* 89th Annual Meeting, Cobo Hall, Detroit, Michigan

Food Chemicals Codex

The National Academy of Sciences, National Research Council and the Toxicology Study Section of the National Institutes of Health have received a $50,000 research grant from the U. S. Department of Health, Education and Welfare to help finance the initial year's work on the preparation of a National Food Chemicals Codex. It is estimated that this project will take some five years to complete. The work will serve as a reference for methods of analysis, as well as standards of identity and purity of chemicals used as food additives.

Hands and Fingers; Legs and Toes

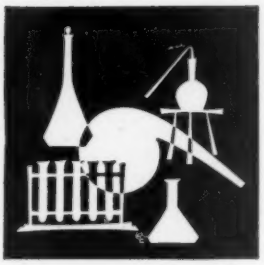
A study by the National Safety Council (1957–59) indicates that almost half of all disabling occupational injuries involve the upper and lower limbs. The findings of the survey by parts of the body are: arms 9.0%; eyes 3.8%; feet 6.0%; fingers 20.0%; hands 7.0%; head 5.9%; legs 12.1%; toes 3.8%; trunk 25%; general 7.4%.

International Occupational Safety and Health Information Centre

The International Occupational Safety and Health Information Centre, located in Geneva, Switzerland, has issued a brochure describing its services. It is the purpose of this organization to make available reference information on legislation and literature dealing with occupational health and safety. The data gathered by this organization is abstracted on 3x5 cards and made available in English, French, and German editions.

Further information regarding this service may be obtained from—C.I.S., % International Labour Office, 154 route de Lausanne, Geneva, Switzerland.

INDUSTRIAL
HYGIENE
MONOGRAPH
#2



by **MARK M. LUCKENS**

Hydrochloric Acid

A. Chemical and Physical Data

Formula:	HCl
Molecular weight:	36.47
Usual form:	a. Colorless to a slightly yellow gas b. Combines with moisture in the air to form droplets of hydrochloric acid
Odor:	Sharp, pungent, (acid taste)
Density:	a. 1.3 (air = 1) b. Considerably heavier as droplets of acid c. 1.639 gms./L @ 0°C (gaseous state) d. 1.194 @ −86°C (liquid state)
Melting point:	−112°C
Boiling point:	a. −83.7°C b. Tends to combine with water to form a constant boiling mixture containing 20.24% HCl; boiling at 110°C
Solubility:	a. 82.3 gms/100 ml H_2O @ 0°C b. 56.1 gms/100 ml H_2O @ 60°C c. 327 cc/100 ml ethyl alcohol d. Soluble in ether, benzene
Flammability:	a. Non-flammable
Explosive Limits:	a. Reacts with most metals to liberate hydrogen, an explosive and combustible gas
Corrosivity:	Attacks almost all metals, vigorously
1 mg/l	670 ppm
1 ppm	1.47 mg/cu. m @ 25°C, 760 M Hg
1 ppm	0.0015 mg/L

B. Occurrence

Hydrogen chloride is rarely encountered, as such, except in the chemical process industries or as an air pollutant. Hydrochloric acid, in various concentrations (or muriatic acid, as it is known in its impure form), is widely used in industry. The acid is used in the manufacture of dextrose from starch, chemicals, pharmaceuticals, dyes, plastics, glues, synthetic rubbers, etc. It also finds application in the pickling of metals; the reclamation of rubber; leather and textile processing; production of oils, fatty acids and pigments; electroplating; engraving; etching; etc.

C. Physiological Response

Hydrogen chloride, a colorless to slightly yellow toxic gas, fumes in the presence of atmospheric moisture to form a mist of hydrochloric acid. It is as droplets of this acid that this compound is encountered in air pollution. In other situations, it is usually found as the acid solution or mist. The toxicity of the acid mist is significantly less than that of anhydrous hydrogen chloride. This latter compound appears to have an immediate toxicity comparable to that of hydrogen fluoride. Its residual effects, however, are not so serious.

Hydrochloric acid mist acts as an irritating corro- respiratory tract. The acid produced on contact with the moisture of the mucosa is extremely corrosive.

Hydrochloric acid mist acts as an irritating corrosive acid on contact with the lining of the nasopharynx and respiratory tract. Excessive concentrations immediately produce coughing, choking, and burning sensation in the throat. The inflammation produced may result in edema and spasm which can prove fatal. Exposure of human beings to concentrations of 0.13 to 0.2 per cent of hydrochloric acid result in death after a few minutes. Air containing 0.1 to 0.3% hydrochloric acid is dangerous to breathe for periods ranging from 30 to 60 minutes. Some studies indicate that work is impossible in an atmosphere containing 50 to 100 ppm of hydrochloric acid. At 10 to 50 ppm, work is difficult but possible. Below 10 ppm, work can be done without disturbance. The maximum concentration which can be tolerated for several hours ranges from 0.001 to .005%. The concentrations tolerable for about an hour vary from 0.005 to 0.1%.

The principal manifestation of the ingestion or contact with hydrochloric acid is irritation and corrosion of the tissues with which it has come into contact. The degree of tissue damage is roughly proportional to the amount and concentration of acid involved.

The symptoms of oral poisoning include severe, burning pain in the mouth, pharynx, and abdomen. This may be followed by vomiting and a diarrhoea containing dark, precipitated blood. (Vomiting is a grave sign since it may result in perforation of the stomach or esophagus.) Yellow and brown stains may be found around the mouth. Blood pressure is usually

sharply lowered. After initial apparent recovery, fever may ensue. This indicates peritonitis or mediastinitis resulting from perforation of the esophagus or stomach. Recovery from primary damage does not eliminate the possibility of serious sequelae. There is aways the grave possibility of scar formaton in the esophagus. This condition results in progressively increasing difficulty in swallowing.

Skin contact with hydrochloric acid results in tissue destruction or irritation of varying intensities. Severe pain and brown or yellowish stains are common signs of contact with the skin. Concentrated acid causes severe burns and permanent scarring of the skin. Gaseous hydrogen chloride causes severe burns, while skin contact with hydrochloric acid mists may give rise to ulcerations and burns of the skin. The acid burns penetrate the entire thickness of the skin. The wounds heal slowly and form scars. Secondary infection of the eroded areas is common.

Even dilute hydrochloric acid, in the eye, causes edema of the cornea and conjunctiva. Symptoms include tearing, pain, and photophobia.

Inhalation of fumes and mists of hydrochloric acid causes choking and coughing, as well as dizziness, headache, and weakness. After a latent period, which may last as long as six to eight hours, pulmonary edema may appear. This condition is accompanied by a tightness in the chest, dizziness, cyanosis, frothy sputum, and air hunger. Abnormal chest sounds, low blood pressure, and an elevated pulse pressure may also be found.

Prolonged exposure to low concentrations of hydrochloric acid mists or fumes causes erosion of the teeth and eventual necrosis of dental tissues and the jaw. Irritation of the bronchi accompanied by a chronic cough and frequent attacks of bronchial pneumonia are fairly common. Disturbances of the gastro-intestinal tract have been reported.

Warm to hot mists of hydrochloric acid may cause bleeding of the nose and gums and ulceration of nasal and oral mucosa. The skin of the face becomes so tender that shaving is painful. Concentrated acid causes severe burns and permanent scarring of the skin. Gaseous hydrogen chloride causes severe burns, while skin contact with hydrochloric acid mists may give rise to ulcerations and burns of the skin.

The maximum allowable concentration of HCl for an 8 hour (industrial) exposure is 5 ppm.

Hydrochloric acid mists, in sufficiently high concentration, have an adverse effect on plant life.

D. Emergency Measures

1. Call a physician at once.
2. Dilute the acid by—
   a. Flooding the area with water for at least 15 minutes.
   b. For ingested acid, give AT ONCE large quantities of water or beaten eggs (at least 12).

   DO NOT WASTE TIME SEARCHING FOR AN ANTIDOTE. Even a delay of a few minutes may allow serious damage to stomach or esophagus. Do not try to insert a Levine tube. Do not induce vomiting.

   c. DO NOT GIVE AN EMETIC.
   d. Ingested acid must be diluted approximately 100 times to make it harmless to tissues.
   e. DO NOT NEUTRALIZE CHEMICALLY, especially when ingested or in eyes.
   f. Hold eyelids apart when flushing acid from eyes with water. Immediately call an ophthalmologist. If one is not available, instill 1% atropine sulfate into the eye until the pupils are widely dilated. Take the patient to an ophthalmologist.
   g. If clothing is contaminated, direct stream of water under clothing while clothes are being removed.
   h. Inhalation—remove from further exposure.

Courses in Radiological Health

The following courses in the field of radiological health will be open to part-time students at N. Y. University Medical Center during the academic year 1961–62. For additional information write to: Professor Merril Eisenbud, Institute of Industrial Medicine, 550 First Ave., New York 16, N. Y.

Environmental Hygiene: Starting September 1961. Lectures and laboratory demonstrations on the engineering control of occupational and other environmental hazards. Factors affecting the health of industrial workers. The evaluation and control of exposure to dusts, fumes, mists, vapors, gases, radiations, noise, abnormal temperatures, etc. Practical examples of environmental control methods. Ventilation, air conditioning, and local exhaust systems. Open to physicians, engineers, and others qualified.

Air Pollution: November 27 through December 8. Designed for physicians, industrial hygienists, and engineers concerned with the problem of community air pollution. Reviews the basic toxicology of the principal air pollutants, micrometeorological factors, the effects of air pollution on agriculture and commerce, and methods for sampling and analyzing for the various toxic components. The principal sources of air pollution are reviewed. Methods for control are described and the pattern of governmental regulations reviewed.

Introduction to Radiological Health: Starting September 1961. The fundamentals of safe practice in the control of radiological hazards from the industrial and medical use of radioactive materials and X-ray equipment. Designed for industrial physicians, industrial hygiene engineers, public health officials, and individuals in industrial and university research laboratories responsible for radiological safety.

Radiological Health Laboratory: Starting in February 1962, covering health physics procedures and use of health physics instruments; Geiger-Muller, scintillation, and gas flow counting techniques. Shielding

(Continued on page 45)

ELECTRONIC NOSE DETECTS

A new group of electronic instruments that detect trace quantities of toxic and explosive gases in the atmosphere has been demonstrated as a basic aid to industrial safety specialists, particularly those in the missile field, and to public health authorities concerned with air pollution control.

Observers at the demonstration included some 150 scientists, missile base officials, safety and hygiene specialists, propellant processors, public health authorities, and representatives of news media and technical publications.

In a dramatic display of the equipment's actual operating capabilities, scientists injected minute quantities of the highly toxic rocket fuel UDMH (unsymmetrical dimethyl hydrazine) into a sealed, transparent chamber. A UDMH type of detector was installed beside the chamber, its nostril tube inserted to sense and monitor the dispersion of the gas.

A cathode ray oscilloscope connected to the instrument showed in amplified form the buildup of gas concentration within the chamber. (Figure 1)

The electronic instrument was adjusted to signal an alarm when the gas reached a pre-established level of concentration. As gas entered the chamber, the needle on the detector's dial moved in proportion to the level of vapor present. At the point when the concentration, expressed in parts-per-million of vapor, equaled the present level, the unit signaled the warning system electronically, causing a horn and flashing-light alarm circuit to come into action.

A similar demonstration followed, using an oxidizer type of instrument to sense the level inside the chamber of the gas nitrogen dioxide, a rocket propellant and also one of the pollutants sometimes present in smog.

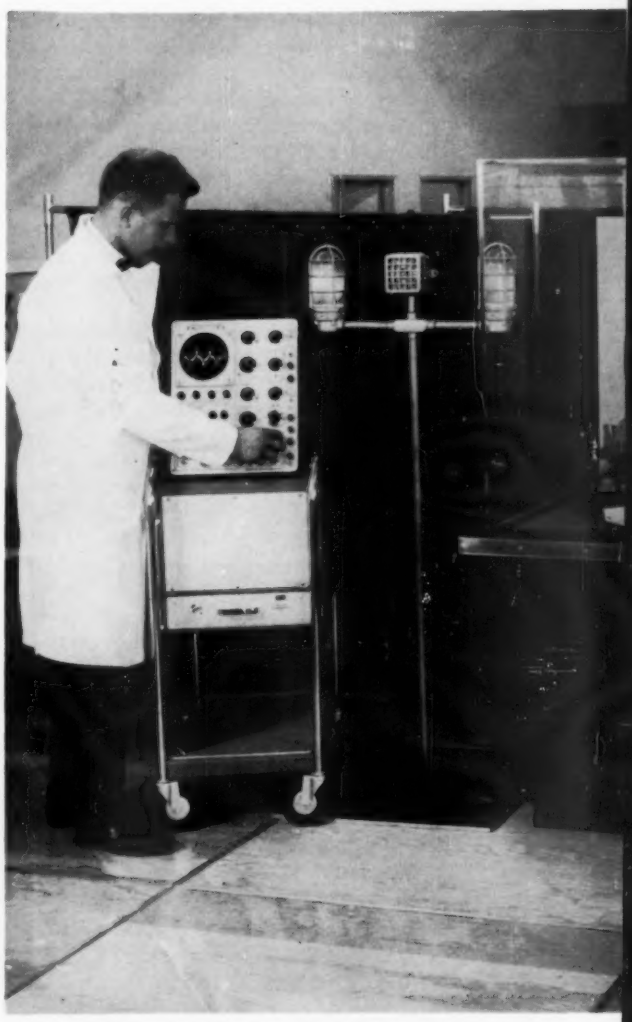
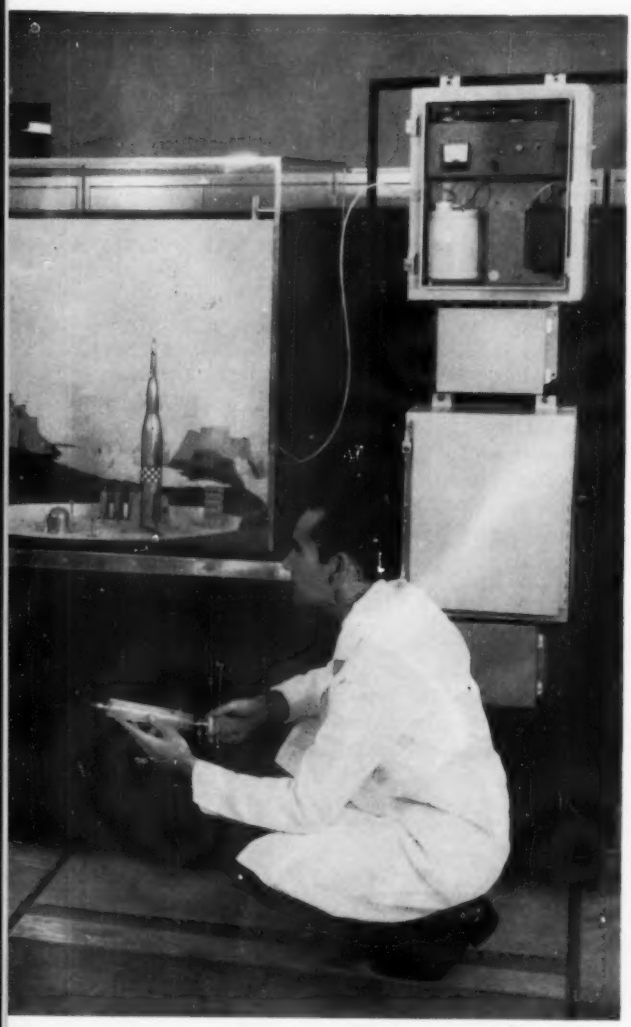


Fig. 1 Gas injected into test chamber by engineer is detected and shown on instrument panel meter. Gas level build-

The basic electrochemical principle of the group of instruments is that the vapor sensed produces a proportional electric current, which in turn can be indicated on a meter, or recorded. Because they are quick reacting, continuous measuring devices, they can readily be incorporated into electronic warning systems. The instruments were especially designed for use at missile installations, and at other locations where propellants are manufactured, tested, transported, or stored. Two such instruments have recently passed extensive field tests at a rocket engine test site.

Fig. 3 Toxic Fuel Detector

TOXIC VAPORS



up, which triggers alarm system when maximum safety level is reached, is displayed also as waveform pattern at left.

Fig. 2 This portable detector extends a five-foot nostril to sniff the gas level at chemical tank hood.

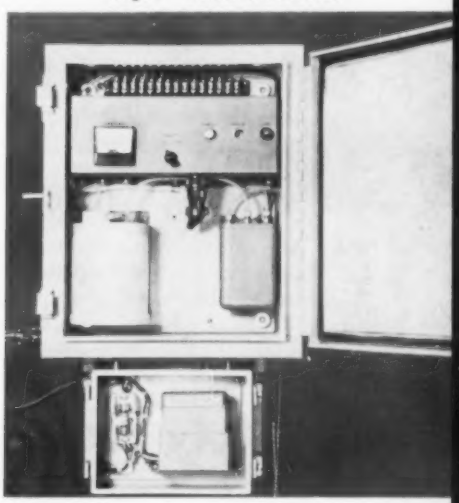
The physical detection principle is also being applied to the monitoring of trace quantities of many other gases and vapors having critical toxic, explosive, or odorous properties. (Figure 2) Among such substances are borane, also a missile fuel, and sulfur compounds sometimes present in natural gas transmission systems.

The exotic liquid fuels, such as nitrogen tetroxide, hydrazine, UDMH, and the boranes, are not new substances to the chemist. He has known, in general, of their toxicity. Today, however, these materials are handled by the hundreds of tons at propellant plants, rocket testing sites, and missile launching installations. As a result, they represent a new safety problem to the industrial hygienist or to the officer responsible for matters of toxicity and hazard. The spillage of a small amount of nitrogen tetroxide in a research laboratory may not necessarily have serious consequences. The spillage of a ton of these materials represents a safety problem of the first magnitude.

The problem of handling tonnage quantities of fuels and oxidizers for rockets must take into account the effect of the vapors upon personnel in the vicinity. The hydrazine fuels and nitrogen dioxide oxidizer have toxic properties at concentrations lower than that at which explosion hazards appear.

The demands for safety now place increasing emphasis on the need for instrumented detection of toxic agents, because it is important to know not only *when*

Fig. 4 Oxidizer Detector



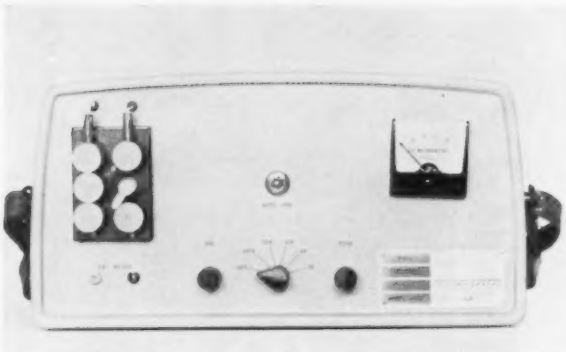


Fig. 5 Close-up of a borane fuel detector is shown here.

exposure has occurred but also the extent and duration of exposure of personnel.

Also, continuous recording of trace quantities of gases and vapors in air and in natural gas has become particularly important in air pollution investigation and control operations in recent years, as well as in the natural gas industry.

Following are more detailed descriptions of three models of the family of new electronic instruments: fuel detectors, oxidizer detectors, and boranes detectors.

Fuel Detectors

In the fuel detector, the fuel vapor is reacted with bromine. The bromine is produced by passing a direct current through a solution of a bromide salt. A pair of platinum electrodes immersed in the solution operate as the generating electrodes. Hydrogen, generated at the cathode, takes no part in the reaction. Bromine is generated at the anode. A second pair of electrodes, also of platinum, operate to sense the presence of bromine in the solution. With low voltage on the electrode circuit, current will not flow unless bromine is present in the solution. In the presence of free bromine the current is proportional to the bromine concentration.

This current-controlling circuit includes a relay which acts as a switch to turn the generating current off at high levels of free bromine, and on at lower levels. This circuit then operates as an automatic control system regulating the bromine supplied to balance the fuel vapor absorbed from the sampled air. The level of electrical current as indicated on a meter or recorder corresponds to the concentration of vapor in the sample.

The commercial model is a self-contained electronic instrument of laboratory precision for detection and monitoring, with a sensitivity of at least one part in four million, of ambient levels of hydrazine and unsymmetrical dimethyl hydrazine (UDMH). It is designed for continuous unattended operation as a sensing instrument, alone or in conjunction with remote control, monitoring, or recording equipment.

It does not require the services of skilled operating personnel, and it incorporates the rugged qualities essential for all-weather operation. (Figure 3)

Oxidizer Detectors

The oxidizer model is a sensitive, high-precision electronic instrument which detects and continously monitors toxic rocket propellant oxidizer vapor present in the atmosphere. It is used in laboratories and operational areas where oxidizer is manufactured, stored, transported, or consumed. Oxidizer vapor, a pollutant sometimes present in smog, is one of the highly lethal oxides of nitrogen emitted during rocket engine testing.

The instrument is self-contained and weatherproof, and may be set up with recording and control equipment for unattended operation at remote locations. The level of ambient toxic vapor, nitrogen tetroxide, is indicated directly in parts-per-million on a panel meter. The detector also provides an electrical output signal which is proportional to the vapor concentration. This output may be transmitted to a remote location and used for monitoring or as an input signal to an alarm device. (Figure 4)

The principle of operation of the oxidizer detector is somewhat simpler than that of the fuel detector. In this instrument the sensing element is in the form of a current-generating cell or battery. A stable cathode is connected to a platinum anode which can only pass current when an oxidizing agent such as nitrogen dioxide is absorbed by the solution. The current developed by the cell is proportional to the quantity of nitrogen dioxide absorbed. This cell, which has been developed for military application where rapid response and broad range are required, can sense one part per million of oxidizer. A range of 1500 ppm is sufficient for practical purposes.

Boranes Detectors

The borane fuel model is a battery-powered, lightweight, portable electronic instrument capable of detecting and measuring very low concentrations of borane compounds in the atmosphere. The instrument is designed primarily for process and field applications requiring close point-to-point inspection or intermittent monitoring service. It may, in addition, be operated on-line from a 115-V power source, or set up with recording and control equipment for unattended operation at remote locations.

Because of its portability (total weight, including batteries, is just 15 pounds) and sensitivity (50 parts-per-billion) it is suited for continuous or periodic analysis of the toxic vapor level in relation to the maximum acceptable concentration. (Figure 5) It utilizes a rechargeable wet battery and two specially designed dry electrolytic cells.

Operation of the unit is based on the principles of current generation in an electrolytic solution. A sample of the atmosphere is drawn continuously through two cells, each containing dry electrolyte. One of the cells is a reference cell, and the other a sensing cell. The air sample drawn into the reference cell is filtered to remove any borane compounds. The air drawn into the sensing cell is not filtered, and any borane vapor in the sample will cause a change, in proportion to its concentration, in the electrical potential of the cell solution. An electronic circuit compares the voltage outputs of the two cells and provides an output signal proportional to the difference. The output signal is read on a meter, which shows the borane concentration in parts-per-million.

A companion instrument is identical in operation, but possesses the additional feature of continuous strip chart recording of the output signal, using internally mounted recording equipment.

A source for further information about any of these new toxic vapor detecting instruments can be obtained on inquiry to the Editors.

Pictures by courtesy of American Systems, Inc.

COURSES IN RADIOLOGICAL HEALTH

(from page 41)

measurements and calculations are made, as well as X-ray machine calibration and survey. Prerequisite or corequisite: Introduction to Radiological Health.

Radiation Hygiene Measurements: September 1961 to June 1962. Laboratory instruction in surveying, monitoring, and sampling procedures. A more advanced course for those who have completed other radiological courses. The various instruments and techniques applicable to survey problems are systematically covered; included are the theoretical basis of the measurements, laboratory exercises in their use, and problem sessions.

Radiochemical Analysis: Beginning in February 1962, covering the techniques of radiochemistry and counting required for the determination of radioisotopes in biological and environmental samples. Particularly concerned with the definition of radiation health hazards from occupational or environmental sources by the application of radiochemical methods. Previous radiological health courses a prerequisite.

Medical & Public Health Control of Ionizing Radiation: March 5 through 16, 1962, outlining the nature and extent of health hazards from ionizing radiation. For physicians, public health officials, and others with biological interest and background. After a review of nuclear physics, the subject is systematically developed starting with the action of radiation at the cellular level and leading up to organ and population effects. Newer concepts of biological mechanisms and pathophysiology are briefly reviewed as a background for understanding radiobiological effects. Particular emphasis is placed on providing a realistic basis for the operation of occupational and public health radiation control programs.

Radiobiology: Beginning in September. A detailed review is presented of the acute and chronic biological effects of ionizing radiation to include such topics as the following: chemical effects and linear energy transfer, target theory, chromosomal and genetic effects, acute cellular responses, physiological and hematological effects, carcinogenesis and life-span shortening, treatment of radiation damage, and biological basis for radiation safety practices.

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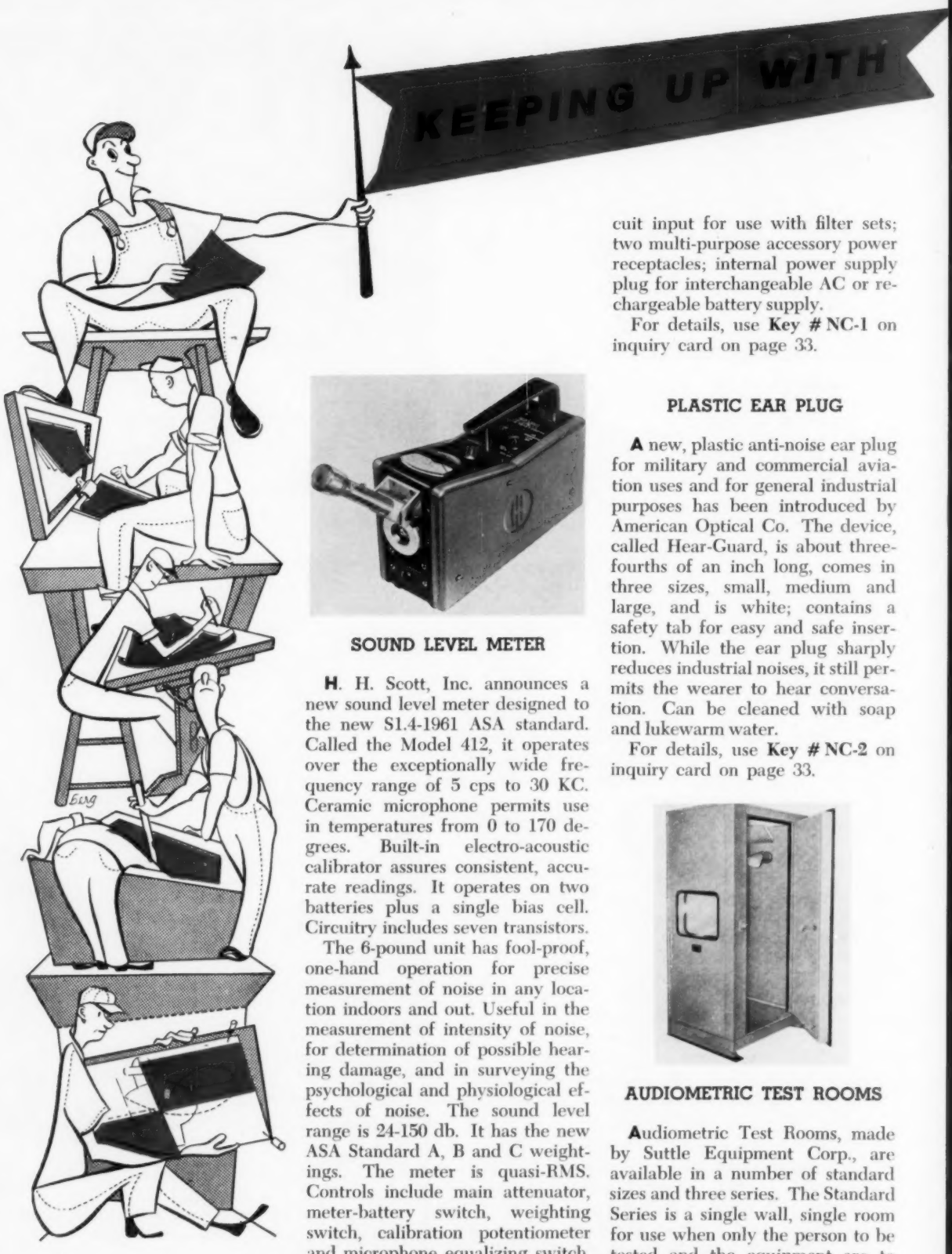
(For details, use Key # J-15 on card on page 33)



SOUND LEVEL METER

H. H. Scott, Inc. announces a new sound level meter designed to the new S1.4-1961 ASA standard. Called the Model 412, it operates over the exceptionally wide frequency range of 5 cps to 30 KC. Ceramic microphone permits use in temperatures from 0 to 170 degrees. Built-in electro-acoustic calibrator assures consistent, accurate readings. It operates on two batteries plus a single bias cell. Circuitry includes seven transistors.

The 6-pound unit has fool-proof, one-hand operation for precise measurement of noise in any location indoors and out. Useful in the measurement of intensity of noise, for determination of possible hearing damage, and in surveying the psychological and physiological effects of noise. The sound level range is 24-150 db. It has the new ASA Standard A, B and C weightings. The meter is quasi-RMS. Controls include main attenuator, meter-battery switch, weighting switch, calibration potentiometer and microphone equalizing switch. External connections include accessory microphone and vibration pickup input; output for earphone, analyzers, and recorders; meter circuit input for use with filter sets; two multi-purpose accessory power receptacles; internal power supply plug for interchangeable AC or rechargeable battery supply.

For details, use **Key # NC-1** on inquiry card on page 33.

PLASTIC EAR PLUG

A new, plastic anti-noise ear plug for military and commercial aviation uses and for general industrial purposes has been introduced by American Optical Co. The device, called Hear-Guard, is about three-fourths of an inch long, comes in three sizes, small, medium and large, and is white; contains a safety tab for easy and safe insertion. While the ear plug sharply reduces industrial noises, it still permits the wearer to hear conversation. Can be cleaned with soap and lukewarm water.

For details, use **Key # NC-2** on inquiry card on page 33.

AUDIOMETRIC TEST ROOMS

Audiometric Test Rooms, made by Suttle Equipment Corp., are available in a number of standard sizes and three series. The Standard Series is a single wall, single room for use when only the person to be tested and the equipment are to be placed in the room. Sizes range from 28″ x 36″ to 96″ x 108″ interior dimensions.

Series 100 is a testing suite ar-

NOISE CONTROL DEVELOPMENTS

rangement consisting of two standard series rooms placed side by side for use where both patient and technician or doctor are to be in similar acoustical environments.

The 200 Series provides an acoustical room within an acoustical room for applications where extreme noise reduction is needed. Standard sizes in this series range from 40″ x 48″ to 96″ x 108″ inside dimensions.

All are made in prefabricated panels and shipped ready for customer assembly. A variety of colors are offered and optional features include continuous ventilation system, one way glass, intercom system, shelves, desks, floor carpet and special jack panel configurations.

For details, use **Key # NC-3** on inquiry card on page 33.

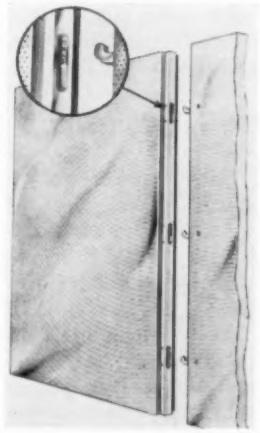
SOUND BARRIERS WITH HARD HAT

Willson's #281 Sound Barrier provides over-the-ear protection against high level noise for workers exposed to both hearing and head hazards. A leather loop and snap fastener at the cap top holds the Sound Barrier in position. Cut out in the side of the safety cap is for ear cushions. The hearing protectors reduce noise over a wide frequency range and the patented vinyl cushions offer complete worker comfort. The fluid filled cushions provide soundtight fit (even with safety glasses) and are easily replaceable without tools or additional parts. Compact and lightweight headframe is adjustable for correct fit by a slide-lock, without removing from wearer's head. Cushions, cups, sponge pads and headframes are easily detachable for cleaning and sterilizing. Available with earphones, earphones with microphones—plus attachments for connecting communication systems.

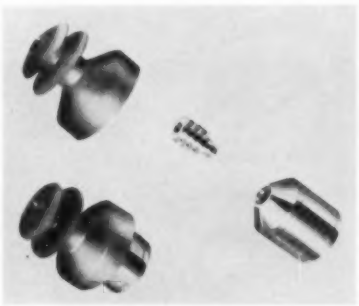
For details, use **Key # NC-4** on inquiry card on page 33.

LIGHT ACOUSTICAL PANEL

A complete line of acoustic panels, modular in construction, for use as sound barriers and enclosures for the control of noise in offices, industrial plants, and laboratories, has been developed by The Korfund Company, Inc., Acoustics Division. The Series 10 NOISE-GUARD Panel, 1″ over-all thickness, consists of a fire-retardant, self-supporting acoustical core sandwiched to sheet metal. While much thinner and lighter than other panels, it provides high efficiency sound attenuation, particularly in the troublesome low frequency spectrum. Acoustical core has sufficient structural integrity to eliminate stiffeners that act as "sound bridges." Sheet metal surfaces have a visco-elastic sound and vibration damping coating to stop resonant responses. Latch-locks join adjacent panels quickly and provide a positive seal to prevent noise leakage. Can be used to construct sound barriers, control rooms, complete machinery enclosures, sound isolation rooms, audiometric rooms, or production test facilities.



For details, use **Key # NC-5** on inquiry card on page 33.



BETTER FITTING EAR VALVES

Sigma Engineering Co. announces a new improvement in their Lee Sonic EAR-VALV hearing protector. That portion of the device which enters the ear has been shortened and completely redesigned for perfect fit with greater comfort for all ear openings, regardless of size or shape. The ear-insert device, which acts as a mechanical sound pressure control, operates automatically to remove the harm from noise without plugging the ears. It permits wanted sounds (such as speech) to pass through into the ear practically undisturbed but dissipates the excessive energy of large volume noise.

For details, use **Key # NC-6** on inquiry card on page 33.

PORTABLE VIBRATION ANALYZERS

A series of portable instruments for vibration analysis and in-place dynamic balancing of machines has been announced by International

Research & Development Corp. To analyze the displacement, frequency and phase of vibrations, the instruments include a displacement meter, frequency meter, vibration pick-up and a stroboscope. The Model 600 is a general purpose analyzer with a frequency range of 450 to 150,000 cpm for all types of rotating or moving machinery. The Model 601 is a low frequency analyzer (150 to 15,000 cpm) designed specifically for slow moving and generally large machinery. Model 311A, designed for use on machine tools, has the same frequency range as the Model 600, but also has a frequency filter for 500 to 5,000 cpm.

For details, use **Key # NC-7** on inquiry card on page 33.

FIBERGLASS ISOLATION PAD

A new, highly efficient vibration isolation pad using specially processed, high density fiberglass has been announced by Consolidated Kinetics Corp. Kinetic Isolation Pads isolate vibration and eliminate lagging machinery to the floor—without cementing, sawing, waiting, or floor drilling. They are furnished in 18″ x 18″ x ½″ sheets, prescored at 2″ intervals for easy cutting-to-size with a pen-knife. Guaranteed not to "creep," this new product permits mobile rather than permanently installed production machinery.

For details, use **Key # NC-8** on inquiry card on page 33.

VARIED MACHINERY MOUNTS

A complete line of mounts to simplify any machine installation job while affording maximum noise and vibration control is offered by Unisorb Division of The Felters Company. Newest additions are a small, leveling model for use on office machines and similar equipment, and a family of "do-it-yourself" mounts which combine all the features of the Level-Rite units with the advantages of custom installations. Unisorb material is now

available in a wide range of thicknesses and densities, tailor-made for different types of installations.

The Level-Rite devices which incorporate Unisorb have been expanded to meet a wide range of demands. Seven sizes are offered in both the LR series, with built-in leveling screws, and the new UL series, which accommodates leveling screws found on some machines or made by the user. Both the LR and UL models are in sizes to carry loads of from 800 to 7500 pounds.

For details, use **Key # NC-9** on inquiry card on page 33.

VIBRATION METER

The Davey Vibrometer Model-1, offered by The Vibroscope Co., is used for testing motors and other equipment. It measures vibration amplitude by oscillation of a light beam on a graduated ground glass scale. The following are recent improvements in design. The glass scale is now mounted at an angle of 30° for more convenient reading. High frequency response has been increased. Models are available with full scale readings of .032″, .016″, .004″ and .002″. Hand held models are also available.

For details, use **Key # NC-10** on inquiry card on page 33.

EAR PROTECTORS FOR SAFETY CAPS

David Clark Co., manufacturers of Straightaway Ear Protectors, introduces its latest model, the 372-26K. Integrating quickly and easily into most safety caps, this new model ear protector kit (pictured above on a Bullard Cap) includes the fittings necessary to attach the domes to a cap. It has been tested and approved for use in harmful noise areas of missile sites, rocket testing, aviation, construction, pulpwood, metalworking and other industries where a noise problem exists and a safety cap is required. Attenuation is kept at a high level. The 372-26K affords excellent protection with maximum comfort. Communications model also available. (Safety cap not included.)

For details, use **Key # NC-11** on inquiry card on page 33.

NOISELESS VIBRATOR

Martin Engineering Co. announces a new vibration inducer in a new permanent mount style for its high amplitude series. Designated DVP and available in five sizes, these vibrators are used for difficult material movement problems, as in coal bunkers, ore chutes,

concrete molds, foundry shake-outs, laboratory testing tables, and other jobs requiring a vibrator with great power and light weight.

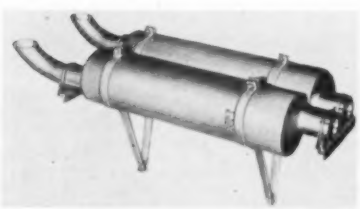
Silent operation makes this series suitable for areas where noise is a problem. Air motor operation is standard in a choice of gasoline, hydraulic and electric drives and may be safely exposed to any weather condition. Available in a wide range of amplitudes, forces and frequencies.

For details, use **Key # NC-12** on inquiry card on page 33.

IMPROVED EAR PLUGS

Rye Sound Corp. has announced improvements in its SEP-1 Super Ear Protectors. The ear plugs have been redesigned for greater efficiency in reducing noise impact under severe conditions and for better fit. The ear plugs are packaged two to a soft plastic pouch.

For details, use **Key # NC-13** on inquiry card on page 33.



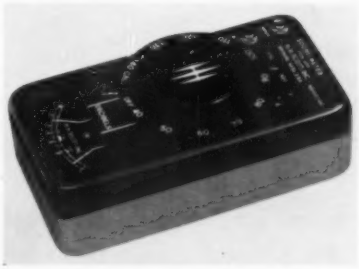
DUAL MUFFLERS

A new, special, dual muffler kit for the White 3000 Series engines with 386-451 cubic inches displacement is now available in the "Engine Mated Sound Sentry" line of mufflers manufactured by Alexander-Tagg Industries, Inc. According to the manufacturer, the mufflers provide 35% less back pressure, 25% reduction in noise level, reduced exhaust temperature, and longer muffler and manifold exhaust pipe life. Made of all welded steel, they are matched to the cubic inch displacement of the engine, giving more horsepower and, eliminating excessive noise. The ATI W-451 Dual Muffler Kit includes vertical straps, hangers, tailpipes, and necessary clamps.

For details, use **Key # NC-14** on inquiry card on page 33.

LIGHTWEIGHT SOUND METER

H. H. Scott announces a new exceptionally lightweight sound meter. Measuring 2″ x 3″ x 6″, the new Model 450 weighs only two pounds, and is operated on an ordinary 22.5 volt battery with an operating life of 30 hours. It has an unusually wide range of operation —from 35.-142 db sound level range and a 40-8000 cps response. Completely transistorized, in a heavy gauge aluminum case, it has a direct



reading scale minimizing chance of reading errors. With a one-year parts-and-labor guarantee, it was specifically designed to the new ASA Standard A, B and C weightings. The amplifier is stabilized against voltage and temperature changes. It can be used for surveying noisy areas; for estimating the possibility of hearing damage; for measuring dispersion pattern and level of sound from public address systems; for determining noise levels of appliances, office equipment and machinery; for checking air conditioning and ventilating systems.

For details, use **Key # NC-15** on inquiry card on page 33.

NOISE INSULATING MOUNTS

A vibration, shock, and noise insulating material is available from Beltran Associates, Inc. Called Keldur, the material is made in sheets 3-feet square and ¼, ⅜ or ½ inch thick for application as vibration reducing mountings for all types of machinery and equipment. The material is adaptable for machinery mounted on pads, bolted, or with a massive sub-base.

For details, use **Key # NC-16** on inquiry card on page 33.

SAFETY by HAWS

HAWS SAFETY FOUNTAINS

Wash harmful fuels and chemicals from eyes and facial areas, instantly! Prevent discomfort and serious injury. Units may be wall or pedestal mounted; with hand or foot operated quick-opening valves.

7900 Series—Maximum coverage eye/face-wash. 6 spray outlets in extra large stainless steel bowl set up soft, drenching mist for positive first aid. Large hand valve.

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7700 Series—Eye/face-wash simultaneously sprays water from perforated copper ring and fountain heads. Stainless steel bowl.

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Instantly flood the body with torrents of rushing water to wash away injurious contaminants. Your choice of single head or multiple nozzle showers; available with hand or foot valves.

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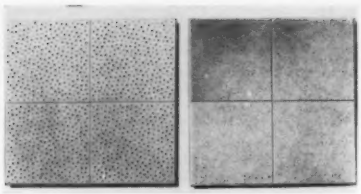
(For details, use Key # J-16 on card, page 33)



FIRE PROTECTIVE ACOUSTICAL TILES

Hansoguard Fire Protective Acoustical Tiles, a new acoustical ceiling tile is announced by Elof Hansson, Inc., Acoustical Division. The new tile is designed to eliminate dangerous heat transmission through the ceiling to protect structural steel. It is available in random perforations and needlepoint perforations. Made of felted mineral fibers with special binders utilizing a formula and method of production which results in a time-rated fire protection. The 5/8" Hansoguard assembly provides a 2 hour fire rating confirmed by Underwriters' Laboratories under concrete and bar joist structures.

For details, use **Key # NC-17** on inquiry card on page 33.

MACHINE MOUNTS

A new line of highly efficient industrial machine mounts which eliminate the need to lag-down

production machinery has been announced by Consolidated Kinetics Corp. In addition to providing mobility for the machines, the Kinetic Mounts have an outstanding isolation efficiency with high internal damping for control of vibration and shock through use of specially processed high density molded fiberglass materials encased and bonded with neoprene. The Model L mounts have a built-in level control and are available in three standard sizes to handle load ranges to 8,000 pounds each.

For details, use **Key # NC-18** on inquiry card on page 33.

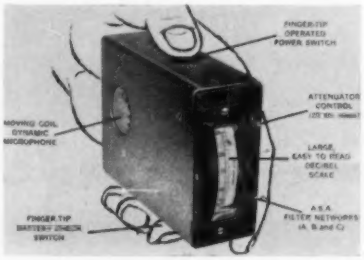
IMPROVED EAR PLUG SET

An improved ear-protector set, consisting of ear plugs mounted on a headset, has been announced by M. C. Rosenblatt. Called "Silents db 75," the device is designed for safety against extreme and high level noise such as that encountered around jet engines. Recent improvements include redesign of the ear piece, eliminating all metal parts. Units are custom-made to order for the highest efficiency in harmful noise attenuation.

For details, use **Key # NC-19** on inquiry card on page 33.

NEW METER MEASURES NOISE LEVEL, VIBRATION

An accurate, inexpensive sound survey meter, miniature in size but rugged and stable in performance, has been announced by the Acoustics and Instruments Div. of the Korfund Co. With transistor circuits, the Sound Survey Meter, Type B, was designed especially for measuring noise levels from 40 to 125 db in factories, offices, public buildings, and in field surveys. A special feature is its ability to measure relative magnitudes of vibration or structure-borne noise by means of a mating transducer which plugs into the meter. This permits singling out any individual source of disturbance. It is also useful to check on progressive wear of machinery parts. Designed for one-hand operation, it weighs only one pound (with battery) and features finger-tip controls.



For details, use **Key # NC-20** on inquiry card on page 33.

COMMUNICATOR EAR GUARD

A new addition to the Straightaway Line of Ear Protectors from the David Clark Co. is a communications model, 372-8BM. The lightweight mike shield encloses a noise cancelling, extended frequency microphone, activated by either a push-to-talk button or toggle switch located on the outside of the shield. Adjustable chin straps of nylon hold the shield in a comfortable position. Ear seals and microphone seals may be removed for easy cleaning, and the head pad for replacement whenever necessary. High db applications include jet engine trim testing.

For details, use **Key # NC-21** on inquiry card on page 33.

SOUND CONTROL PANELS

Sound Control Panels, made by Suttle Equipment Corp. are available in several thicknesses with a variety of absorption and transmission loss characteristics. The absorbant face is perforated steel over acoustical glass fiber. Back surfaces are solid heavy gauge cold rolled

steel. All panels are stiffened internally and bake painted for durability. Widths vary from 12" to 48" and lengths from 48" to 120". Using special mouldings for the joints and corners, they can be used to form a variety of rooms and partial enclosures for product testing quiet rooms, audiometric test rooms, noisy machinery enclosures, plant partitions, shop supervisor offices and many other applications. Doors and windows are also available.

For details, use **Key # NC-22** on inquiry card on page 33.

RANDOM NOISE GENERATOR

H. H. Scott Inc., announces introduction of a new Random Noise Generator called the 811B as a convenient, reliable source of "white noise" for many laboratory applications. Incorporating an exclusive internal pink noise filter which gives equal noise power per octave from 20 cps to 100 KC, the 811B is especially useful for many acoustic and psycho-acoustic measurements. Also useful for measurements on acoustic materials, rooms and transducers; high intensity noise and vibration testing; balancing paging and music systems; audiometry and masking studies; random stimulation of analog computers; production testing of transducers, filters, loudspeakers and enclosures; and calibration of sound measuring equipment.

For details, use **Key # NC-23** on inquiry card on page 33.

Fire Alarm
(from page 38)

fire captains may be one and the same group. This is a matter of choice.

Fire Committee & Duties of the Committee

1. To meet as often as necessary for the safeguarding of human lives and property.
2. To establish such rules and regulations as are necessary for adequate Fire Prevention and Control.
3. To determine the causes of any fire originating in the plant and prevent its reoccurrence.
4. To devise ways and means for the elimination of fire hazards that may exist in their plant.
5. To hold each fire captain responsible for the proper discharge of his duties and for the enforcement of regulations as prescribed by the Committee.

General Duties of Fire Captains

Each industrial plant creates its own fire hazards. Therefore, different plants must institute different fire regulations. However, there are some fundamental rules that are the same in all plants. The fire captains must know these general rules and are responsible for having them carried out.

Specific Duties of a Fire Captain

1. To appoint as many assistants as are necessary to properly safeguard human lives and property.
2. To assign each employee under his jurisdiction to a fire station.
3. To inform each employee of his duties as to fire prevention and control.
4. To train himself to be able to recognize fire hazards.
5. To report immediately any fire hazard in his area and suggest the proper corrective measures.
6. To submit to the committee any special regulations which would facilitate the safeguarding of lives or property.
7. To institute fire prevention regulations as the need arises.

It is the responsibility of the Director of Fire Prevention and Control to take a census of the people regularly in the building plus the number of visitors and customers. This will provide a basis for determining whether the required means of egress are adequate.

The building exits code, prepared by the committee on safety to life of the National Fire Protection Association, shows how to calculate required egress. The survey may show that changes are necessary for maximum safety.

Fire drills for good building evacuation have two purposes: to save the lives of the people in the building and to aid the fire department. If the people are out of the

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2. Prevents accidents
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6. Will save injury & compensation costs
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(For details, use Key # J-17 on card, page 33)

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IT'S IN THE CARDS (18 min.)

". . . deals with the problem of . . . carelessness and chance taking . . . the film is so excellent . . . that it's highly recommended as a supplement and attitude builder in any program."

Association of Casualty & Surety Companies

IT DIDN'T HAVE TO HAPPEN (13 min.)

". . . deals with . . . familiar personal attitudes which are responsible for either safety or tragedy . . . the film has impact and suspense; it is an excellent job."

Association of Casualty & Surety Companies

"In our estimation this is the most excellent film we have ever seen on safety."

Swivelier Company, New York

For a complete list of 16mm sound Industrial Safety Films write or telephone

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(For details, use Key # J-18 on card, page 33)

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- POSTERS—novel and humorous.
- BADGES—for your Safety Committeemen, Fire Brigade, Safe Worker, and others.
- POCKET PROTECTORS.
- DECALS.
- SAFETY BOOKLETS—for the children of your employees.
- INDIVIDUAL RECOGNITION—to your Safety Committeemen, Fire Brigade, Supervisors and Employees. Items they will appreciate—at nominal cost.

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(For details, use Key # J-19 on card, page 33)

building when the fire department arrives, then the firemen can devote their full energies to extinguishing the fire. (Figure 11) Be sure to inform the firemen where the fire is and the nature of the fire.

In conclusion let me state that the old axiom we hear so often "This building is fireproof" is a myth. There is no fireproof building even if it is constructed of steel, concrete, brick or other so-called fireproof materials. (Figure 12)

A structure is only as "fireproof" as are its contents, occupancy, and the kind of housekeeping that is carried on within that building. A blazing interior fire of long enough duration will reduce any so-called fireproof structure to shambles of twisted steel and broken masonry.

Reference Material for Organizing a Plant Fire Company
Employee Organization for Fire Safety
Building Exits Code, Seventeenth Edition, 1960, N.F.P.A. #101

Both of these excellent books can be purchased from—
National Fire Protection Association
60 North Batterymarch Street
Boston 10, Massachusetts

Pictures by courtesy of the author. From an address presented at the 1961 Purdue Industrial Fire Control Conference.

First Quarter Injury Rates at Record Low

Work injuries in manufacturing plants reached a record low rate of 10.4 per million man-hours worked during the first quarter of 1961, according to preliminary reports released by the U. S. Department of Labor's Bureau of Labor Statistics.

This rate was 6 percent below the 1960 first quarter injury-frequency rate of 11.1 and slightly below the previous record low first-quarter rate of 10.5 established in 1958. It was the same as the fourth quarter of 1960—the record low for any quarter.

From the record monthly low of 9.7 in December 1960, the monthly injury-frequency rate showed about the usual seasonal increase, to 10.5 in January. February remained the same, though there is usually a slight increase between January and February. The March rate declined more than usual. The 1961 rates for both January and February were at record low levels for the respective months, and the March rate equalled the previous record low established in 1958.

One Point Changes

Decreases of 1 full frequency-rate point or more between the first quarters of 1960 and 1961 were reported for 50 of the 131 individual classifications for which comparable data were available. Corresponding increases occurred in 21 industries. The remaining 60 showed little change.

The logging industry showed the greatest improvement over the year, with a rate of 50.5 injuries per million man-hours in the first quarter of 1961, compared with 60.7 in the first of 1960. Electrical products, not elsewhere classified, decreased from 9.5 to 2.4; miscellaneous leather products, from 13.8 to 7.6; hand tools, files and saws, from 16.7 to 11.0; fabricated wire products, from 16.5 to 10.9; and shipbuilding and repairing, from 16.4 to 11.3.

On the other hand, substantial increases in injury rates occurred in the insulated wire and cable industry, from 9.8 in the first quarter of 1960 to 16.6 in the first of 1961; metal doors, sash, frames, and trim, from 14.0 to 20.5; and cutlery and edge tools, from 8.6 to 14.3.

Consulting Service In Driver Safety

The availability of special consulting services on a nation-wide basis has been announced by Drivers Safety Service, Inc. of New York. Starting immediately, the expanded consultant staff of the organization is prepared to assist industry and governmental agencies in driver selection, testing, training and provide specialized traffic research services.

Drivers Safety Service is the consultant to the Division of Motor Vehicles in the State of New Jersey (since 1952), was a consultant to the U. S. Navy in 1959 and 1960, and has provided research on grants from the National Institutes of Health of the Department of Health, Education and Welfare. With the addition of new staff members, and through the expansion of facilities that offer more comprehensive services, the organization can now place men in the field on a much wider scale. Heretofore, the organization's activities have been largely confined to the New York-New Jersey Metropolitan areas.

For further information, write to Dr. Herbert Sheppard, Director, Drivers Safety Service, Inc., 298 Broadway, New York 7, N. Y.

MAINTENANCE

Southeastern Engineering and Maintenance Show

Plant engineering and maintenance equipment will be shown under simulated operating conditions at the third Southeastern Show, to be held in War Memorial Coliseum in Greensboro, N. C., September 12–14. Concurrently, the third Southeastern Seminar at the adjoining Town Hall will feature talks by outstanding engineering executives and group discussion of actual plant and building engineering and maintenance problems.

Sponsorship

The Southeastern Show is being produced by the show management division of John Harden Associates, public relations counselors of Greensboro and Raleigh. The seminar is sponsored by the Piedmont, Triangle, Smokey Mountain, Two Carolinas, and Atlanta, Ga. chapters of the American Institute of Plant Engineers. Robert E. Zimmerman of the John Harden staff is show manager, and J. R. Ogburn of Raleigh is chairman of the seminar.

Purpose of the combined show and seminar, the two spokesmen said, is to demonstrate to plant engineering and maintenance personnel the latest in equipment and supplies, and to bring these technical people together to hear of new ways to expedite production and reduce operating costs.

Products and services to be shown under simulated operating conditions include electrical, heating, ventilating, air conditioning; painting, safety, and power transmission equipment; lubricants; paints; building materials; and maintenance tools and supplies. Two sections of the show devoted to welding and materials handling are expected to draw wide attention.

Exhibit

Thus far, Zimmerman said, approximately 80 of 100 booths have been committed, with exhibitors from throughout the nation. The show and seminar are expected to attract more than 10,000 visitors to Greensboro, mainly from the Carolinas, Virginia, Georgia, and Tennessee.

In the seminar prominent engineers will discuss techniques that have expedited production and reduced costs in their own operations. After each talk, other engineers and maintenance managers assist the speaker in a discussion period at which registrants may bring up their own operational problems.

Admission to the engineering and maintenance show is free, Zimmerman said, but visitors must register and wear their identification badges.

Welding Developments

The latest technological developments in the fabrication and assembly of metals will be revealed by the leading authorities in this field through a series of papers to be delivered at the National Fall Meeting of the American Welding Society which will be held at the Hotel Adolphus, Dallas, Texas, September 25–28.

AWS has taken a step toward solving the serious problem of duplicate research efforts by assuming the role of a central clearinghouse for scientific projects within its field. In addition, it is making available to those concerned with the sciences of welding and metallurgy, research data literally lifted from the laboratory research projects. Nearly 50 papers and seminars in 16 sessions will be presented to top engineers and scientists from all over the U. S. These papers will reveal the latest developments from the most authoritative laboratories in the country, which use the most sophisticated equipment yet devised and are supervised by the outstanding people in the field.

Mutual Problems

"In today's technological race for survival," stated Fred L. Plummer, National Secretary of the American Welding Society, "these technical meetings are invaluable. The information disclosed by research and development engineers, and other key personnel is in the hands of management very shortly after company engineers return from the meeting." He went on to say that one of the greatest benefits of such meetings was the opportunity to meet with other engineers and discuss mutual problems. "It is surprising," he said, "the number of companies who are working on problems which have already been solved by others."

SYNTHETIC TOW ROPES

The two largest fleet tug-operating concerns serving New York Harbor are Moran Towing & Transportation Co., Inc. and McAllister Bros., Inc., two of the oldest firms in the business and two of the most competitive. But both are in agreement that synthetic ropes, and particularly those made of polypropylene fibers, have made remarkable inroads in the marine industry at the expense of the older, heavier lines used in the Harbor for more than a hundred years.

Synthetics Gain

In the short space of four years, according to a survey of the two firms just made by the largest producer of polypropylene fibers used for ropes and cordage by the marine industry, the new synthetics quickly have captured most of the older markets and have opened up new markets never before available to manila and sisal.

Rod McAllister, purchasing agent for McAllister Bros., believes that it was simple "dollars-and-cents logic" that won over the marine industry to synthetic ropes. "It is only about three years ago that we put polypropylene lines aboard our first harbor tug for testing. At the time, I'd guess the Harbor was about 90 percent manila. The switchover hasn't been complete, but today certainly 80 percent of the harbor boats use *some* polypropylene, and our own tug fleet is almost 100 percent converted to the new ropes. We keep putting them on board as quickly as the old lines become unusable."

Captain Leonard Goodwin, Marine Superintendent in charge of operations for Moran Company agreed that the Harbor now is about 80 percent in synthetic fiber lines. He added, however, that Moran isn't completely "sold" on 100 percent polypropylene in all its ropes, as is McAllister. "Our ropes are primarily a combination of the synthetics. We like one in particular that has a nylon core, with polypropylene for a second layer, and dacron forming the outer covering strands. This combination rope that we use now on most of our harbor work seems to bring out the good qualities in all of the synthetics."

Good Service

Captain Goodwin recalls that the first synthetic line ever used by Moran was all-dacron. "We had it on the tug for more than two years before it began to show any real

The "Moira Moran" Works the "Queen

With towline secured, captain of the "Moira Moran" gives last minute advice to deck hand before taking wheel. Rope is easy to handle blend of nylon, propylene and dacron.

Several turns around bitts guide Queen Mary away from dock as deck hand prepares to slack off if the rope appears to freeze on bitt. This prevents buildup of excess tension.

LIGHTEN MAINTENANCE LOAD

signs of wear. Over all, I'd say that our synthetics last at least three to four times longer than the old lines did—and in some cases we've had them on a tug as long as twelve months after we had thrown away the natural lines."

Both Rod McAllister and Captain Goodwin agree that adoption of synthetic lines has cut their rope maintenance costs substantially. Captain Goodwin reports: "We were able to cut rope costs slightly better than half, based on length-of-life usage." Mr. McAllister said about comparative costs: "We used to average about $80,000 a year on rope purchases. For the last couple of years our purchases of the synthetic fiber lines has dropped our costs between $48,000 and $55,000. But that's not the whole story, by any means. Our curve-of-use shows up better, we don't need to use so many lines, and the men take to these lighter lines like ducks take to water. They look better, they feel better, and they're a lot easier to handle on board."

McAllister Bros. has about 85 tugs in all of its operations; Moran has, in all, about 100 tugs. McAllister tends to use polypropylene ropes almost exclusively in its harbor operations—"they're excellent for close-in work." Moran sticks with the combinations, using six lines per tug, each about 180 feet long.

Sea Towing

For sea towing, both firms switch to nylon, and both tend to use nylon for pennant towing, too. Sea tows need stretch, and nylon gives it to them.

Neither firm uses the synthetics on their barges. Because rope handling is infrequent, both prefer manila here.

Deckhands interviewed at both firms were greatly impressed by the new synthetic lines. "The first thing about them that surprises you is how light they are, especially the polypropylene lines. You can pick up the whole length of the line, all 180 feet of it, and hold it above the deck like this," said a deckhand aboard the "Ellen F", one of McAllister Bros. fleet of 17 tugs serving New York Harbor, and he hefted the whole line in both arms. "You try to do that with the same footage of manila and I don't think you could even lift half of it clear."

(Editor's Note: A hundred feet of polypropylene 8½ in. line weighs only 130 lbs. The equivalent length of manila would weigh almost 300

(Continued on pages 58 and 59)

Mary" from Dockside into Hudson River

Stowing rope after job, deckhand lays it out for ready use. Six to eight ships per day is average service for these tugs, which keeps their six lines at work all day long.

Good rope housekeeping on "Moira Moran" has all ropes neatly stowed and tied down. Nylon is used for all sea towing, while the combination ropes are used in harbor.

THE NEWER ROOFING

by **KENNETH N. BANTHIN**
Plant Engineer
Visking Co., Div. Union Carbide Corp.
Chicago, Illinois

This second year of the new decade is one of readjustment and has developed as a year of "Challenge." Many managements in spite of increased sales have seen a reduction of profits because of increased production costs. Each plant engineer or maintenance head is therefore obligated by the nature of his position to examine carefully his physical plant and equipment and then make full use of the new materials and techniques available to him. Only in this manner can he reduce the fixed costs of maintaining buildings, grounds, equipment and services to meet the Challenge of the 60's.

The present discussion will be limited to the newer materials available for roofing. Every plant has roofing maintenance problems, both periodic and emergency. Recent developments of new materials for roofing can reduce both the headaches and high costs of keeping a roof over your facilities.

Roofing Problems

The majority of industrial plants have flat or slope roofs, with coverings consisting of multiple layers of rag or asbestos felt, saturated and bonded with asphalt or pitch. In some cases these coverings may be underlaid by board, cork, or monolithic insulation. Many flat roofs are topped with a hot mopping of pitch or asphalt and then graveled.

In the minority, are slope roofs of precast concrete tile, clay tile, slate, asbestos, poured gypsum, or sheet metals.

Built-up felt and asphalt or pitch roofs deteriorate from the effects of the elements and mechanical damage. Light, heat, wind, and rain remove the asphalt or pitch binder and leave the felts dry and brittle. Expansion, contraction and puncture are the predominant causes of mechanical damage. In the past, repairs have been limited to hot mopping of the exposed surface, patching with felt, cap sheeting, and replacement of entire roof.

New Materials

Now we have available some of the newer materials such as:

1. Fiberglass fabric with tear strength far in excess of felts for use as a flashing or patching material in connection with asphalt, pitch, or other binders.

2. Plastic screen fabric for reinforcement of fiberglass or felts as used for flashing points of mechanical movement such as expansion joints.

3. Plastic elastomer flashings for those hard-to-hold locations such as around sheet metal or plastic ducts.

4. Special cold-application mixtures and blends of asphalt, synthetic rubber, silicones, and plastic. These are used on the cleaned roof to resaturate the top layers of felt and also provide a new exposed surface to the elements. Cleaned gravel is replaced as desired. These materials are readily applied by plant maintenance personnel. Flash-

MATERIALS

ing, bad spots, or cracks are usually patched with fiberglass or jute fabric and cold mastic binder prior to the application of the resaturating material. On large areas, costs are reduced by the use of a pump and hose to move the resaturating material from drums on the ground to the roof. The cost of this application is usually less than a hot mopping of asphalt or pitch.

5. Special hot application mixture of asphalt, silicones, and plastic are sprayed on under pressure and heat to the cleaned roof to resaturate the top layers of felt and provide a new exposed surface. Flashing and bad spots, or cracks, are usually patched with fiberglass or jute fabric and hot asphalt prior to the application of the hot resaturating material. This hot mix is applied at a temperature of approximately 250°F and with from 0.5 to 0.9 gallons per square yard of roof surface. Heavier build-ups are obtained by multiple passes. Cleaned gravel is replaced as desired. The application of this material is done by a contractor who has specially constructed and heated tank trucks equipped with pumps, hose, and spray equipment. The cost of this application is usually less than a conventional single-felt cap sheet installation.

6. Spray application of asphalt and chopped glass fiber roving is applied directly on a new deck or over old roofing. In this application the asphalt emulsion is stabilized with a mineral (clay) colloid for protection against degradation and blistering. Flashing is easily covered, the roof is tight but has enough elasticity to take care of expansion and contraction. Surface repairs are made by patching with a trowel. A crew of three men can roof 15,000 to 18,000 square feet a day with this method and material in contrast to five men putting down 8,000 square feet a day of conventional multi-layer roofing.

Insulating Materials

New production methods often necessitate some form of roof insulation to reduce the sun's heating effects in summer or prevent heat loss or condensation in the winter. The conventional methods of using cork, cane board, or fiberglass block have been available for some time. In this field some of the newer materials are:

1. An aluminum-filled asphalt base coating that is applied to the cleaned roof surface and will reflect the rays of the sun. Differences of temperature up to 8°F are noted when measured on the underside of the roof deck before and after coating.

2. A thin aluminum sheet that is applied with suitable hot or cold binder to cleaned non-graveled roof surfaces will reflect the rays of the sun. This application is more desirable than the aluminum-filled asphalt base coatings but requires considerably more technique for proper installation.

3. Water sprays in themselves are not new but new modern lightweight aluminum pipe systems and special low-water-capacity, stainless steel spray nozzles do warrant further consideration of this method.

(Continued on page 60)

The "Ellen F. McAllister" Shows Long Work Life of Polypropylene Fiber Ropes

Maneuvering derrick barge off lower Manhattan, "Ellen F." uses pure polypropylene for most harbor work. Several McAllister tugs have used same lines for 3 years.

Comparison of two lines shows long life of polypropylene fiber ropes. Line at left, used 9 months, is quite worn but without a break. Right line has had 3 weeks' hard use.

Wear on "Ellen F.'s" lines, all polypropylene, is shown by surging at pier. Lines suffer all day from rough wood docks and wire rope on piles. Six lines are carried for harbor work.

Lifting entire line clear of dock illustrates lightness and "layability" of propylene fiber ropes. Manila rope cannot be lifted thus, and cannot be stored wet like polypropylene.

Tow Ropes

(from page 55)

lbs. Moreover, breaking strength of the polypropylene line would be nearly one-third greater than that of the manila line.)

There were other advantages cited by the deckhands of both firms, such as the fact that polypropylene handles well despite exposure to oil and chemicals because the fibers have excellent "built-in" resistance to them. The fact that the synthetic fiber lines float is a great help in handling; you always know where the line lies in the water. Moreover, because polypropylene doesn't absorb water, it weighs the same wet or dry; no added "hands" are needed to haul it in.

Nor was splicing of the synthetics a problem at either firm: The strands could be laid open without effort, and the splicing itself is a simple job, requiring only that the deckhand take care to hold the twist and whip each strand with tape at intervals along its length. After each strand is properly whipped, the hand merely follows the same procedure as with the splicing of any fiber rope.

Along this line, Captain Goodwin recalled that in the early days of Moran's adoption of the new synthetic ropes "we worried a little whether or not we ought to bring all the men in to give them group instruction in handling the new lines. We found, though, that the good practices they had adopted for the manila lines worked equally well on the synthetic lines. No extra instruction was needed."

Pictures by courtesy of Dawbarn Brothers, Inc.

Fire Hazards

(from page 29)

Design and Protection

1. Properly engineered silhouettes will assist the exhaust system in containing vapors within the system.

2. Quick releasing valves to enable rapid removal of material are a requisite just as for dip tanks.

3. The drip tunnels and space separating the flow-coater from the oven must be long enough so that all the excess paint is removed before the object enters the oven. Accumulations of dripping paint could cause, and have caused, fires in the ovens. Electrostatic detearing may be employed as a method of facilitating the removal of excess coating material.

4. Proper sprinkler and other types of extinguishing equipment should be used. Their cost will be recovered by means of lower insurance premiums. A substantial dividend not to be overlooked is the peace of mind that goes with knowing your plant will not be shut down by a major fire.

5. Interlocks should be provided so that the paint supply pump ceases to operate if:

a. There is a fire,
b. The ventilation fan fails to operate, or
c. The conveyor stops.

6. Freshly coated stock coming from either a dip tank or flow-coater should be ventilated to keep the atmosphere around it below the lowest explosive limits. Note that less solvent is immediately released from the finish when applied by dipping, flow-coating or roller coating than from a spraying operation. Hence, greater safeguards are necessary during the drying phase of these operations.

HEAT TREATING OR QUENCHING TANKS

A brief reference will be made to hardening and tempering tanks, which have a different function from a dip tank, but which do involve flammable liquids under circumstances quite similar to those of a dip tank. We do know that fires frequently occur in these tanks, due, primarily, to one cause: The overheating of the surface of the liquid or the entire contents of the tank. With its flashpoint reduced sufficiently, it will ignite as heated parts are brought near it. This is generally due to overloading the tank.

There are four cardinal rules to observe:

1. Use the proper type of liquid which should never be raised to a temperature of 50°F. below the flashpoint of such liquid.

2. Adequate ventilation should be assured with properly sized and insulated vents to the exterior of the building. This will prevent dangerous condensate forming about and above the tank and also will vent fire from the area in case of such an emergency.

3. Install proper drain facilities.

4. Provide interlocks or warning signal devices whenever the temperature of the liquid is less than 50°F. below the flashpoint of the liquid.

ROLLER-COATING

The process involves the passing of stock between revolving rollers partially submerged in a finishing material, or occasionally drawing the stock through the finishing material and then through the rollers to secure an even deposition of material.

The foregoing safety precautions should be observed, plus the further one that adequate static eliminators should be installed and the metallic parts of the machinery should be grounded.

The maintenance of a relatively high humidity is further recommended.

Other Means of Applying Industrial Finishes

The same requirements of adequate ventilation, isolation from fire, sparks or excess heat, and good housekeeping are the positive fire prevention controls recommended when finishes are applied by either the brush, blade or doctor knife.

Conclusion

Eternal vigilance, coupled with the application of fundamental rules discussed above, can eliminate most fires, and the attendant waste. If we divide last year's fire losses among the entire population of the United States, it comes to almost $9.00 for each man, woman and child. Paraphrasing the popular quotation from the Elizabethan Poet, John Donne—When the fire bell tolls, it tolls for thee to the current amount of at least $10.00 per annum.

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From an address presented at the 1961 Purdue Industrial Fire Control Conference. Pictures by courtesy of The DeVilbiss Co.

N.Y.U. Safety Courses

The Center for Safety Education at New York University has announced a series of courses in industrial and motor fleet accident prevention for the fall term from September 25th through January. The courses are open to both management and employees of industrial and business organizations. Following are the specific subjects covered by the courses:

Accident Prevention—Its Background, Objectives, and Relationships Subjects include: early industrial developments in accident prevention . . . public disasters and their influence . . . accident control legislation . . . insurance company safety services . . . relationship to production efficiency . . . professional opportunities. . . .

The Philosophy and Basic Principles of Accident Prevention Subjects include: fundamental principles and philosophy of accident prevention . . . relative importance of unsafe acts and mechanical hazards . . . opportunities for correction of accident causes . . . sources and methods of securing accident facts . . . corrective action . . . creating interest. . . .

Industrial Hazards—Mechanical and Personal: Control Methods Subjects include: hazards of structures and grounds . . . plant equipment and apparatus hazards . . . lighting and ventilation . . . metal-working and wood-working . . . food manufacturing . . . textile operations . . . approaches to corrective action. . . .

Collection, Analysis, and Use of Accident Data. Technical Sources Subjects include: sources: internal and external . . . assisting agencies . . . what is essential . . . codes and practices . . . collection of essential data . . . how to analyze data . . . the uses of accident data and by whom . . . sources of technical data. . . .

Technical Aspects of Accident Prevention Subjects include: heat . . . electricity . . . sound . . . gases . . . plastics . . . demolition . . . excavation . . . steel erection . . . construction . . . application of basic science to accident prevention. . . .

Accident Prevention for Motor Vehicle Fleets: Organizing the Program Subjects include: need for a planned program . . . developing an accident control man . . . reporting, analysis, inspection . . . securing and maintaining interest . . . student problems . . . practical application of principles. . . .

Fire Prevention and Protection Inspection Subjects include: nature of an inspection . . . qualifications of inspectors . . . chemistry and physics of combustion . . . phenomena producing fire . . . flammable liquids, gases, dusts . . . extinguishment systems . . . analysis of an industrial establishment. . . .

Effective Speaking in Accident Prevention Subjects include: preparation of speech . . . content of speech . . . plans and blueprints of safety speech . . . bad speech habits and their removal . . . how to give the speech . . . how to conduct meetings and panels . . . speeches, class reactions and suggestions by instructor. . . .

Tuition for each course is $40. For further information, write or telephone the Center for Safety Education, New York University, 6 Washington Square North, Room 42, New York 3, N. Y., telephone: SPring 7-2000; Ext. 632. Registration may be made in person September 11–15, 12–5 p.m.; September 18–29, 12–8 p.m.; and on Saturday, September 23 and 30, 10 a.m. to 1 p.m.

Roofing Materials

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4. A monolithic, thermo-plastic-bond, volcanic-glass, spread and compacted insulation may be placed right over your cleaned old roof. This material is readily shaped to provide more effective drainage to new or existing roof drains. In this method the old uninsulated, built-up asphalt- or pitch-bond roof surface is not removed but is used as a vapor barrier. All loose gravel is removed and any blisters opened and patched. The insulating material is mixed on the job in a special, truck-mounted mixer and then spread hot on the old roof surface to definite depth and contour. The material is then raked to a smooth gradiant and compacted by means of a powered roller. Approximately 2½″ of this compacted material has the same insulation quality as 2″ of cane board insulation. This insulation is rot-proof, vermin-proof, and highly fire-resistant. After application, a new built-up roof is readily applied. In general, this method of insulation is less costly than a cane-board or cellulose-board installation and also permits proper contouring of the roof surface to provide effective drainage.

From an address presented at the 12th Plant Maintenance & Engineering Conference.

Instrument Automation

(from page 19)

latest concepts and theories, ideas and applications of instrumentation.

Intense interest coupled with rapid advances in areas of the technology have resulted in expanded programming to accommodate certain presentations: Aero-Space, Bio-Medical, Data Handling & Computation, Management, Measurement Standards Instrumentation, Shock and Vibration, Strain Gage Instrumentation.

Automation and instrumentation are also highlighted in the cement and lime, and the pulp and paper industries. Other conference sessions include electronic instrumentation, nuclear measurements, feedback control system optimization, photographic measurements and analysis instrumentation.

inside the trade

At a recent meeting approval was given to the formation of the *AMERICAN SEAT BELT COUNCIL*. The new group will function as an auxiliary organization of the *Narrow Fabrics Institute* and will be under the management of Penn Affiliates, Inc. Charter Members include the leading manufacturers of automotive seat belts and component parts, including webbing, hardware, yarn, etc.

The ASBC will develop a program of voluntary self-regulation to insure that belts offered for sale to the consumer meet minimum recommended standards. Committees will be established by ASBC to cooperate with other organizations and agencies in the promulgation of standards. In this regard, one of the first actions was adoption of the SAE Recommended Practice covering Motor-Vehicle Seat Belt Assemblies. Announcement was made at the meeting by the President of the Automobile Safety Belt Institute that its activities will be replaced by the new organization.

CHICAGO EYE SHIELD CO. has announced the appointment of *Roger W. Williams* as a member of its sales engineering staff. He is a graduate of Ohio Wesleyan University and also held a graduate fellowship at Ohio State. For several years he was employed as a research engineer at Battelle Memorial Institute, and he has ten years' background in safety engineering work. Mr. Williams is a member of the Society of Automotive Engineers and the American Industrial Hygiene Association.

Kenneth E. Quick has been appointed sales representative for *THE DAY SALES CO.* He is a partner in the firm, Pike and Quick Associates, 300 S. Murphy Ave., Sunnyvale, Calif. and will represent the company in metropolitan San Francisco and the Northern California area. Mr. Quick is a veteran application engineer in the fields of industrial dust control, pneumatic conveying and bulk material storage.

The formation of a new petrochemical company, *Ancon Chemical Corp.* which will produce methyl chloride is announced by Robert C. Hood, president. Ancon is a jointly owned subsidiary of *ANSUL CHEMICAL CO.* and *CONTINENTAL OIL CO.* Construction of a new plant in Lake Charles, La., to produce about 60,000,000 pounds of methyl chloride annually, is expected to start immediately with the completion scheduled for early 1962.

ROCKWOOD SPRINKLER CO. announces the appointment of *Harry M. Goodchild* as Assistant General Manager. He comes to Rockwood from the Bellofram Corporation in Burlington, Mass. where he had been General Manager for the past year. Prior to that he had worked at plants of Fairbanks Morse & Co., the Taunton Pearl Works, and the Merrimac Hat Corp. He was educated at Haverhill High, Philips Andover Academy and Northeastern University where he studied Mechanical Engineering.

Rockwood Sprinkler Co. also announces the appointment of *William J. Carroll, Jr.* as Sales Manager of its Fixed Piping Protection Department. Associated with Rockwood since 1945, Carroll worked in the Sprinkler Engineering Department until 1946 when he transferred to the New England Sprinkler Sales Department. He received a bachelor's degree in Mechanical Engineering from Worcester Polytechnic Institute in 1942, and is also a 1960 graduate of The School of Industrial Management of Worcester Polytechnic Institute.

L. C. Bailey

L. C. Bailey has been appointed Sales Manager, *Industrial and Marine Division, WALTER KIDDE & COMPANY, INC.*, according to an announcement by Walter E. Morgan, Jr., Division Vice President. In his new post Mr. Bailey will be responsible for sales of Kidde portable fire extinguishers and engineered extinguishing systems. He joined Kidde in 1957 and previously was Boston Regional Manager. He attended the University of Vermont and graduated from Babson Institute.

James Nichols has been appointed Metropolitan New York Regional Manager of the Industrial and Marine Division. Mr. Nichols will be responsible for the sales of Kidde fire detecting and extinguishing equipment in New York City, northern New Jersey, and Long Island. He will maintain offices at 140 Cedar Street, New York City.

He joined Kidde in 1942, and served in a number of sales positions, most recently as manager of Technical Services of the Industrial and Marine Division. He attended Newark College of Engineering.

Appointment of *L. A. Miller* as executive vice president of *CENTRAL SCIENTIFIC CO.* of Calif., a subsidiary of *Cenco Instruments Corp.*, Chicago, was announced by Ralph C. Read, president. Miller is also vice president of marketing for Central Scientific Co., Chicago, a division of Cenco Instruments. He joined the firm in 1959 as director of marketing. Prior to that he was marketing manager for the Eugene Dietzgen Co. and a consulting engineer and staff engineer for the Standard Oil Co. (Ind.) He is a graduate of the Illinois Institute of Technology and John Marshall Law School.

Swords Supply Service, with headquarters in Atlanta, Georgia, will represent *AMERICAN INDUSTRIAL SAFETY EQUIPMENT CO.* in the Southeastern territory. *P. A. "Nick" Swords, Jr.*, who heads the representative firm has a long and varied background in the safety field. He has been associated with Linde Air Products Co. in Atlanta for ten years, Southern Oxygen Co. in Roanoke, Va. and most recently with Ford Supply Co. in Atlanta.

Officials attending the annual midsummer meeting of *MASURY-YOUNG CO.* included *Robert D. Lane*, Corporate Secretary; *W. V. Voorhees*, Regional Sales Manager, Chicago, Ill.; *Douglas Hancock*, National Sales Manager, Myco Branch; *Donald M. King*, President; *Louis W. Dee*, Executive Vice President; *Raymond R. Campbell*, Treasurer; *G. R. DeNapoli*, Vice President in charge of Research and Production; and *Joseph A. Pozycki*, Re-

gional Sales Manager, Kansas City, Mo. The status of the company was reviewed and long-range objectives were discussed during the week-long meeting. Representatives from several nationally known retail firms spoke to the group, and Tri-Poxy—Masury-Young's new cold-process epoxy type resurfacing and patching material for concrete, wood, and metal floors —was demonstrated at the Company's plant in Boston.

LUXO LAMP CORP. has announced the establishment of a Chicago office, under the supervision of *John S. Sprenger*, at 600 West Jackson Blvd., Chicago 6, Illinois. The Midwest office will service Illinois, Wisconsin and Indiana.

Promotion of *Richard H. Shepard* to Sales Manager of the Chicago area is announced by *INLAND WIRE PRODUCTS CO.* Before his recent appointment, Mr. Shepard was for four years the direct sales territory salesman for the St. Paul, Minneapolis, and Central Northwest area. He is a graduate of the University of Illinois in industrial engineering.

THE FAIRBANKS CO., manufacturers of a complete line of valves, trucks, casters, wheels, etc., moved its Boston Branch Office and Warehouse on August 15th., to an all-new building at 767-A Concord Avenue, Cambridge 38, Mass. These new and improved facilities will enable the company to provide faster and better service.

The promotion of *Frank S. Drake* to Vice President of the *FALCON ALARM CO., INC.*, has been announced by C. E. Graham Reeves, company president. Mr. Drake, previously associated with the Colgate-Palmolive Co., Procter & Gamble Co., and General Mills, Inc., joined Falcon as Director of Marketing a year ago. He will continue to direct Falcon sales and promotion, coordinating the national sales activity for all Falcon products. He will continue to be located at the company's plant and home office at 243 Broad St., Summit, N. J.

MINE SAFETY APPLIANCES CO. has announced it is consolidating the divisionalized research activities of the parent corporation and a research subsidiary. J. T. Ryan, Jr., MSA president, said all basic and applied research, product development, and engineering will be centralized in a newly-established corporate Research and Engineering Division. Personnel and facilities of MSA Research Corporation also will be integrated into the new Division.

Roger F. Mather, formerly associated with the Product Development Division of the U. S. Steel Corporation, is director of the Division, and Dr. *W. P. Yant*, who has been in charge of the parent company's research activities for the past 25 years, will become Research Consultant to the President. Dr. Yant is nationally known for his work in industrial hygiene, having served as first president of the American Industrial Hygiene Association in 1939.

Mr. Ryan also announced the appointment of three associate directors and a manager of administrative services to complete the executive direction of the new Division. These appointments include: *J. W. Mausteller*, Associate Director-Research; *R. C. Werner*, Associate Director-Engineering and Development; *J. P. Strange*, Associate Director-Product Engineering, and *D. N. Wise*, Manager of Administrative Services.

THE BERYLLIUM CORP. has announced the appointment of *Alaskan Copper & Brass Co.* as their northwest distributor for beryllium copper mill products in the Vancouver and Seattle areas. A sales staff of twenty-five men will be available to service the many Berylco accounts in this territory.

Alaskan Copper & Brass has been a stocking distributor since 1913. General offices are located at Seattle, Wash., with warehouses in Seattle and Portland.

Safety Personnel

William R. Bradley and Associates of Newark, N. J., environmental health consultants have announced that *Arvil B. Pettit*, formerly Director of Industrial Health and Safety for W. R. Grace & Co. has joined their firm as a consultant on safety, fire and explosion, and marine hazards.

While at W. R. Grace & Co., Mr. Pettit had complete responsibility for industrial health and safety, including fire prevention and air and water pollution control of more than 70 industrial plants and mines in the United States and abroad.

Patrick S. Sirois has been named director of personnel and safety for Holsum Bakers. The announcement was made by R. E. Chivers, Vice President and General Manager. Sirois joined Holsum in 1960 as Safety Director. He was formerly Director of Safety and Personnel for The Miami Transit, The Miami Beach Railway and South Miami Coach Line companies.

Active in local and national safety activities, Sirois was Chairman of the safety committee of the Miami Beach Chamber of Commerce, a delegate to President Eisenhower's conferences on Occupational Safety in 1956, Past Program Chairman of National Safety Council's Transit Section, an Executive Committee Member of the Motor Transport Conference of National Safety Council, Past General Chairman of the South Florida Chapter of the American Society of Safety Engineers, Chapter Representative and Executive Committee Member of The American Society of Safety Engineers and was a Speaker at the National Safety Congress in Chicago in 1957 and again in 1958. He has appeared as Guest Lecturer in the "Effective Fleet Operation" courses sponsored in the area by The University of Miami and The Dade County Board of Public Instruction. He is also the author of several articles on traffic safety.

C. H. Williams, long recognized as one of the pioneer spirits of the safety movement, recently retired as Superintendent of the Engineering and Inspection Department of the United States Casualty Company and the New Amsterdam Casualty Company. In his 46-year association with the insurance industry, Mr. Williams was responsible for countless innovations in loss prevention and safety in all its industrial phases. He plans to serve as a safety consultant in Florida.

Chemical Safety

More than 100 industrial safety experts from the U. S. and Canada are expected to attend a chemical industry safety workshop in Niagara Falls, Canada, September 27. The workshop, sponsored by the General Safety Committee of the Manufacturing Chemists' Association, Inc., will provide committee members with an opportunity to discuss and share solutions of common safety problems with production, technical and safety personnel in the chemical industry in Canada and Northern Pennsylvania and western New York.

J. S. Queener, Manager, Employee Relations Department of E. I. du Pont de Nemours & Company, Inc., and chairman of the MCA committee, will be the workshop moderator. Collaborating with MCA on the workshop will be the Niagara division of the Industrial Accident Prevention Association, for Canada, and the American Society of Safety Engineers.

This will be the first international safety workshop conducted by the committee. Previous workshops have been held in Philadelphia, Chicago, Houston and South Charleston, West Virginia.

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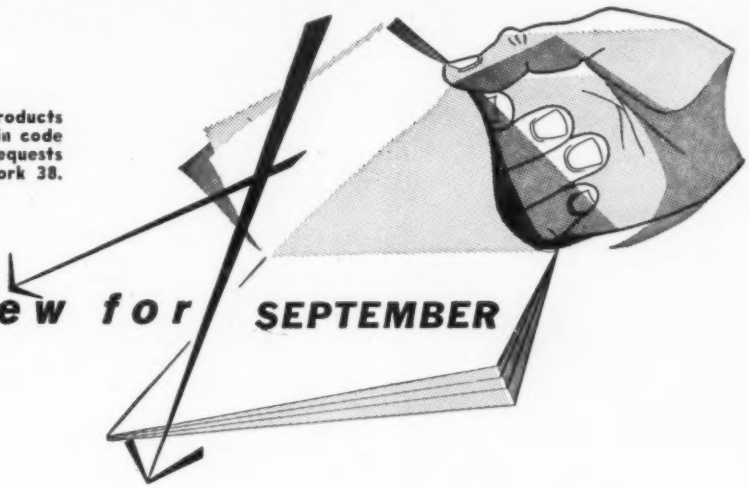


what's new for SEPTEMBER

RESTYLED SAFETY GLASSES

(Use Key # 733 on Inquiry Card on page 33)

THE American Optical Company's Safety Products Division has redesigned its Flexi-Fit line of safety glasses to incorporate several new features. The major change is use of a seven-barrel hinge which is 40 percent stronger than the five-barrel hinge used in the past. Incorporated in this hinge is a new Duragrip temple screw assembly which keeps temples tight permanently. Screws cannot fall out. These glasses give a wider choice of temple styles and frame colors. Frames are available in pink crystal, smoke or mahogany. Because of a saddle bridge, the Flexi-Fit can be worn by between 85 and 95 percent of safety glass users. Higher back bevel of the lens groove holds them securely and resists impact. The line also is available with side shields.

ANTI-SLIP FLOOR COATING

(Use Key # 734 on Inquiry Card on page 33)

A SOLUTION to slippery areas, "Magic" Non-Skid Anti-Slip Coating For Safer Surfaces, is a new product of the Silicone Paper Co. of America. Factory-tested for over a year, this epoxy product is said to provide excellent protection against slips and resultant falls. When applied to a properly prepared surface, the coating gives a durable and safe surface to wood, concrete or steel. Unaffected by weather, it is applicable for floors, walkways, stairs and ramps, both indoors and outdoors. Conveniently packed to slip-proof 90 square feet.

FOOD & WATER SURVIVAL KIT

(Use Key # 735 on Inquiry Card on page 33)

A FOOD AND WATER survival kit capable of sustaining one person for fourteen days in an emergency situation is now available from Surviv-All, Inc. to meet the growing demand for a kit of this sort by civil defense-minded individuals, industries and institutions. It is also an excellent emergency kit for boat or airplane owners, persons living in hurricane and tornado belts and for any natural disaster where food and water might be critical for a few days.

The 24-pound kit contains a basic nutrient —Multi-Purpose Food, a product of General Mills, Inc.—14 pints of vacuum-packed water, Vitamin "C" ascorbic acid supplement and the necessary utensils. The kit meets the specifications for survival as prescribed by the Office of Civil and Defense Mobilization, and has a shelf life of from three to five years.

NEW SNAKE BITE KIT

(Use Key # 736 on Inquiry Card on page 33)

A. E. HALPERIN, CO., INC. has introduced a new plastic Snake Bite Kit, #099, containing a new, more efficient plastic syringe made from durable, black cellulose-acetate-butyrate plastic. There are two different attachments for the syringe for small or large area venom removal. The kit also contains a plastic-handle lancet with stainless steel blade, a permanent grease cup for syringe lubrication, as well as other basic first aid supplies for snake bit treatment. The kit weighs less than 4 ounces and measures only 4" x 2⅛" x 1¼".

FAIL-SAFE MAGNETIC CHUCK

(Use Key # 737 on Inquiry Card on page 33)

SAFETY ENGINEERS will be interested in the new "Electroperm" magnetic chuck manufactured by the O. S. Walker Co. The new chuck embodies the principles of both permanent and electro magnetic chucks. During machining, however, the chuck is powered solely by permanent magnets. Despite electric power failure, the chuck maintains full holding power.

Electric current is only used for energizing and de-energizing the magnetic chuck. These chucks are not dependent on the coils for operation during the actual use of the chucks. The H. Energy Permanent magnets are magnetized by the coils during the short energizing period. After magnetization which takes only about one second, the current is automatically shut off and the chuck is ready. There is no heat build-up in the chuck, no distortion due to thermal expansion; and the chuck is more stable. The circuit to the chuck is completely isolated from the A.C. power source. The chuck itself is grounded by the machine table.

THE FIRE MUFFLER

(Use Key # 738 on Inquiry Card on page 33)

FOR YEARS asbestos has been accepted as one of the foremost products of fire prevention. Now the Janos Asbestos Co. is utilizing the fire resistant properties of asbestos in a blanket to smother fires in industry or the home. The Fire Muffler unit is contained in a red metal canister, which has a metal loop for easy attachment to walls or accessible surface; or unit can be placed directly on the floor. The 5' x 5' asbestos fire muffler is easily removed from canister by grasping the finger loop on tip of blanket as shown in the picture. The Fire Muffler will never burn nor wear out—no refills needed. It is easy to use and effective for smothering small fires, including burning clothing.

TINY GLASS "WATCHDOG" WARNS OF RADIATION

(Use Key # 739 on Inquiry Card on page 33)

A TINY PIECE of glass, no longer than a quarter-inch segment of pencil lead, has become a "watchdog," warning doctors and scientists against the dangers of excessive exposure to radiation. The cylindrical rod of silver-activated material is part of a new recording system designed by Bausch & Lomb for use in atomic energy installations, research labs, hospitals, wherever people must work with X-Ray, Gamma, or high energy Electron radiation. The rod is extremely sensitive to radiation exposure. In as little as fifteen seconds after exposure, a technician, using a special reader, can determine the exact dosage of radioactivity to which a person wearing the rod has been subjected. This is done by inserting the rod into a new instrument known as a Microdosimeter, and charting the change in fluorescence which has taken place in the rod as a result of its exposure.

In contrast to the limited measuring accuracy of the usual film badge, the glass rod is capable of measuring over a range of from 10 to 10,000 rads, giving single and accumulative exposure readings.

In the event of a radioactive explosion, the rod would immediately provide an extremely sensitive means of checking the precise degree of exposure of individual victims. Medical research and the exploration of outer space are two further areas in which the B & L dosimeter system is recording nuclear data. Because of the extremely small size of the rods, implantations can be made into parts of the human body during isotope therapy. In radiation labs, the microdosimeter rods are being used in conjunction with the traditional film badge.

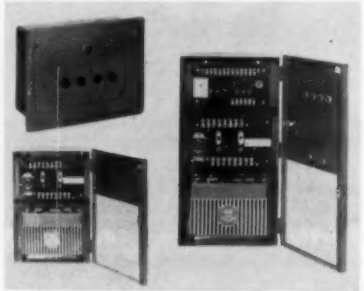
The new Microdosimeter Reader, used for measuring the exposure of the glass rods, is capable of highly accurate measurement of X-Ray, Gamma, or high energy Electron radiation. Developed by Bausch & Lomb, the compact instrument has a range of 10 to 10,000 rads, with an accuracy of at least ± 4%. The reader, as part of an integrated system with the glass rods, is capable of measuring a wide range of high energy radiation and consequently is designed for many types of "hot lab" work. Single as well as cumulative dose readings can be taken over extended periods of time.

FIRE ALARM CONTROL CABINET

(Use Key # 740 on Inquiry Card on page 33)

A NEW automatic fire alarm control cabinet has been announced by Kidde Ultrasonic & Detection Alarms Division, Walter Kidde & Company, Inc. The basic compact unit monitors one circuit with a local alarm only. It draws its power from a 120 volt AC line and converts it to 6 volt DC for actual operation. Upon an AC power failure the cabinet sounds a trouble alarm and automatically transfers to self-contained battery operation. A four zone annunciator panel may be added. Another unit combines the control panel and four zone annunciator in one cabinet.

Any number of detectors and noncode breakglass stations can be used with the new panel and a locking type alarm relay permits the use of self-restoring detectors or stations. Two vibrating bell circuit terminals are provided, but any number of bells can be used up to a total load of one amp. All panels and cabinets are Underwriters' Laboratories listed.



OUTDOOR EMERGENCY LIGHT

(Use Key # 741 on Inquiry Card on page 33)

A NEW weather-proof battery-operated emergency lighting unit for outdoor applications is now available from Electric Cord Co. All electrical components in the sturdy Light Warden 300 series are hermetically sealed against moisture, dust or corrosion. Rubber gasketed throughout, the units feature a weather-defying corrosite finish and can be exposed directly to the elements with guaranteed performance. Battery choice ranges from 40 to 105 amp hours, guaranteed from five to fifteen years. The units are self-charging, operating from regular house current, with high rate charge for restoring energy after use, and trickle charge to maintain energy level. Visible hydrometer balls permit instant reading of charge level.

SHOP COAT FEATURES SAFETY DESIGN

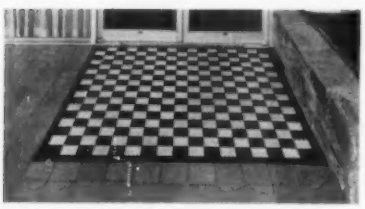
(Use Key # 742 on Inquiry Card on page 33)

A NEW, exclusive Safety Shop Coat by Can-Pro Corp. has been designed to minimize the possibility of accident. Safety sleeves are tapered with no loose cuffs. Straight back has no belt that can catch in machinery. Safe laundry-proof metal snap fasteners open quickly in an emergency. Sewed-down micrometer or small instrument breast pocket cannot become caught in moving machinery; is designed so contents will not fall out. Angle pockets have no dangerous flaps . . . double thick bottoms for longer wear . . . exclusive design to keep chips and dirt out of pockets. Made of Mercerized and Sanforized all cotton washable material, in regular weight or light weight. Other features include double thick cuffs, side vents for access to inner clothing, stylish notched collar. Available in 6 colors—and all sizes—34 to 56.

ROPE LOWERING CONTROL

(Use Key # 743 on Inquiry Card on page 33)

SKY GENIE, a shock absorbing safety device to prevent accidents and control the lowering of personnel and equipment, has been introduced by Atlas Safety Equipment Co., Inc. The unit may be used with a safety belt, boatswain chair, stretcher, etc. This lightweight and foolproof device, provides complete one-man control and requires only finger tip pressure for start, stop or deceleration. Rate of descent is predetermined, and control is effected either by person lowering himself, or by person located above or below point of anchor. The unit enables safe suspension at any point desired for maintenance, repair and rescue work, and is used also to limit the extent of free falls when used with life lines. Device consists of an aluminum shaft furnished with a length of strong, lightweight nylon line. The rate of descent is predetermined by the number of times the line is turned around the aluminum shaft and weight of person or object lowered. Tested to a minimum of 1500 pounds, it is available with 20, 50, 100, 150 or 200 ft. lines.



REVERSIBLE FLOOR MAT

(Use Key # 744 on Inquiry Card on page 33)

A NEW floor mat with the added feature of being completely reversible has been announced by the American Floor Products Co. Made up of 4 by 4 inch sections of ribbed polyvinyl chloride, its flexible wiping blades are designed as dirt traps to "scrape" the bottoms of the shoes of persons entering a building. The interlocking sections give the mat a "no hole" construction feature, making the mat safe and efficient even with spike heels. The "Imperial" is available in a wide variety of colors in solid or checkerboard designs. It can be easily rolled, and steel bar reinforced nosings eliminate corner curling. Can be built to almost any size and shape.

COMBUSTIBLE GAS ALARM

(Use Key # 745 on Inquiry Card on page 33)

JOHNSON-WILLIAMS, Inc. have announced a new addition to their line of combustible gas detectors and alarms, the Model RH diffusion-head type alarm for the continuous monitoring of hazardous locations for the presence of natural gas, LPG, and other combustible gases and vapors. The analyzer unit is housed in a dust-proof aluminum case designed for flush or surface mounting and should be located in a gas-free area. Indicating meter, lamps and operating controls are displayed through the glass window in the hinged door. Transistor-regulated power supply holds constant voltage to the filament despite power line variations. The detector filament head is enclosed in a cast iron housing for location in the area to be monitored and connects to the analyzer by means of three wires in a ½" conduit. A flame arrestor screen allows the atmosphere to reach the filament but prevents ignition of explosive fumes. The standard Model RH can be modified for rack mounting and multi-point monitoring. Also available in an explosion-proof housing.

NOISELESS WET VACUUM

(Use Key # 746 on Inquiry Card on page 33)

A NEW mechanical sound muffle reduces sound of the Nobles SpeeDry wet pick-up floor machine in operation by 50%. The sound reduction is achieved without loss of air-flow through the new SpeeDry model V24-BQ. It removes floor moisture in one pass as fast as operator can walk. The SpeeDry holds 10 gallons, has dump valve that can drain tank in 20 seconds. Water lift of 62 inches, the machine is convenient, easily portable and attractive. Many features make it easy to use and maintain. Although a wet pickup vacuum, it can be equipped for dry pick-up with the Dry-Pak attachment.

The new muffle design which reduces high frequency random sounds of both the motor and the high velocity air, makes it especially suitable for hospitals, institutions, etc.

NEW SAFETY SLOGAN CUPS

(Use Key # 747 on Inquiry Card on page 33)

A 4½ OUNCE cone-type water cup, imprinted with designs aimed at promoting safety, has been added to its line by the Dixie Cup Division of American Can Company. The cup is being produced as a result of demand by construction firms and contractors.

NON-SLIP COATED CLAMPS

(Use Key # 748 on Inquiry Card on page 33)

CHARLESTON RUBBER CO. has announced additon of rubber coated, non-slip clamps to its line of Charco "Bulldog" blanket and wire clamps, used extensively by electric utilities in high voltage work. According to the manufacturer, there has been a demonstrated need for a clamp with greater resistance to slipping and this new optional feature on Charco clamps is the answer. Any of the several clamps in the Charco "Bulldog" line may be had with this non-slip coating at very slight additional cost.

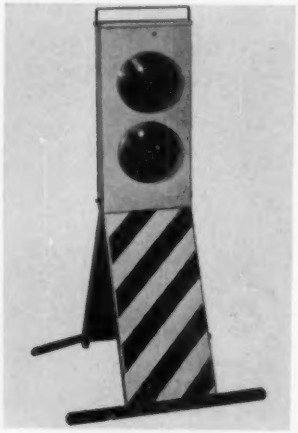
The non-slip rubber coating is obtained by dipping Charco clamps into a special roughening solution of neoprene rubber. Heat applications cure the rubber and bond it firmly to the wood. The rubber coated clamps are resistant to oil, water, creosote and other chemicals.

Used with the linemen's protective blankets, the new clamp assures a firm rubber-to-rubber grip; and the cushioning effect of the clamp's rubber surface protects the blanket. Charco "Bulldog" flag clamps also are available with the non-slip neoprene coating.

ITALIAN DRESS-SHOE STYLED SAFETY SHOE

(Use Key # 749 on Inquiry Card on page 33)

SAFETY SHOES take a giant stride toward ready acceptance and universal wear by industrial employees, in this high-styled new all-occasion oxford in mahogany grained leather with hand-stitched Guantone seam that parallels the sole. Leather outersole, leather stormwelt, perspiration-resistant innersole and glove-tanned cowhide lining make it as luxurious and handsome as any top-grade dress shoe. Even the steel box toe is newly tapered for a smarter look. Available from Safety First Shoes, Inc.



FLASHING BEACON

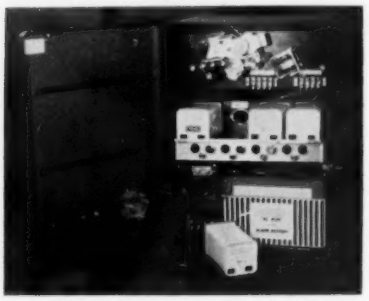
(Use Key # 750 on Inquiry Card on page 33)

NEW Blink-N-Beacon transistorized warning flasher lights with a minimum battery life of 1,500 hours have been introduced in a portable vertical safety barricade by Electronic Division of Barler, Inc. Operating on a standard 6-volt dry cell battery, the new barricade flasher with red or amber plastic lenses can be seen from either direction for a half-mile in the most extreme weather conditions—snow, sleet, rain, fog—and much longer distances under normal conditions. Flashing rate is a uniform 50 to 60 a minute, or can be supplied at other flashing rates. The protected push-button switch can be operated by a pencil or dowel. Barricade is light in weight, but its folding widespread leg design prevents knocking over by wind. Suitable for all types of road hazards, construction jobs, traffic control, in-plant danger spots and pedestrian crossings.

CODED ALARM PANEL

(Use Key # 751 on Inquiry Card on page 33)

NOTIFIER CORP. announces a coded transmitter panel, Series MCN, especially designed to meet general government specifications for automatic fire detection and alarm systems. Coded signals are shunt non-interfering, and allow the MCN panel to be connected to most standard coded systems. The unit combines a mechanically wound McCulloh transmitter with a control panel and power supply in a single housing, 12" w x 18" h x 7" d. It permits 6 different basic performances, merely through changing plugs. Each variation can have either or both a trickle charger and a current supervisory meter, as optional equipment. The panel provides for: a. Standard 4-round coded alarm signal, plus optional 1-round coded trouble and 4-round coded restore signal; b. Immediate operation of local alarm, without waiting for transmission of coded signals; c. Electrically supervised main operating power and station circuit wiring to announce trouble conditions; d. Automatic transfer to emergency power on failure of commercial power; e. Automatic conditioning for "Class A" operation; f. Sealed relay equipment in dust-proof, tamper-proof metal plug-in units.



ANCHORING COMPOUND EXPANDS

(Use Key # 752 on Inquiry Card on page 33)

A PRODUCT first used to secure rail posts in concrete is now gaining wide use in industry. Called Quik-Rok, made by Preco Chemical Corp., it is a fine-textured powder that, mixed with water, sets rock hard within twenty minutes. Unlike concrete, which shrinks upon setting, Quik-Rok expands to hold heavy objects securely. Stronger than concrete, its uses include anchorage of heavy posts and machinery, filling holes in factory floors, caulking around fixtures and pipes or to set electric wall boxes and cabinets in masonry partitions.

HOLD-BACK GUARD FOR NUMEROUS MACHINES

(Use Key # 753 on Inquiry Card on page 33)

THE NEW Possons Hold-Back Safety Guard can be used in a variety of applications such as rolled mills, pug mills, meat grinders, calenders and shears, in addition to certain punch press operations. The operator wears nylon wrist bands, which are attached to adjustable length nylon straps. The straps are held securely by special fittings on the cross arm. The heavy duty standard is anchored to the floor. The individually-adjustable straps restrain the operator's hands from reaching into any type of danger area. The Possons Hold-Back, made by Positive Safety Mfg. Co., is designed for use where hands *approach* the danger zone, but are not required to enter. If hands must enter the danger area of a reciprocating machine, the Possons *Pull-Back* Safety Device is recommended.

NEW GAS MASKS

(Use Key # 754 on Inquiry Card on page 33)

A SEAMLESS leak-proof canister—first of its kind—spearheads a list of exclusive features in the complete new line of gas mask respiratory protection just introduced by Mine Safety Appliances Co. The new drawn canister removes potential sources of leaks, since side and top seams have been completely eliminated. The new line of masks also has a new harness design, and a rugged plastic case that is chemically inert and resistant to moisture.

Every canister is equipped with a high-efficiency toxic dust filter which, together with the appropriate chemical fill, permits its use in atmospheres containing both gase-

ous and particulate contaminants. The special filter provides greater application flexibility and reduces the number of types of canisters needed for protection against gaseous and toxic aerosols.

A threaded neck on the canister permits rapid disconnect from the breathing tube to speed replacement, simplify maintenance and prolong life of the breathing tube. Similarly, a universal coupling nut on the facepiece of the mask facilitates disassembly from the breathing tube.

Use of the lightweight "Clearvue" facepiece—available with the new gas mask line—provides panoramic vision, a speaking diaphragm for clear communication, and provision for prescription spectacles. The M-S-A Maskfone, a sound-powered communications system for remote operations, can also be adapted to the new facepiece.

The M-S-A Industrial Mask protects against a specific gas or group of gases and aerosols in atmospheres where sufficient oxygen is present to sustain life, and where concentrations of toxic gases or vapors do not exceed two percent by volume (three percent in the case of ammonia). Such hazards are encountered in the chemical, petrochemical, meat packing, water-treating, synthetic fiber, and paper mill industries; in insecticide and pesticide operations; in grain fumigation; and in other related applications. The M-S-A Super Size mask offers the same degree of protection as the Industrial Mask, but for longer periods of time. The Tank Gauger's Mask is designed for protection against petroleum vapors and hydrogen sulfide encountered in the petroleum industry.

GOGGLE CLIPS FOR HARD HATS

(Use Key # 755 on Inquiry Card on page 33)

TO SOLVE the problem of goggles slipping off the smooth surface of hard hats and caps, American Industrial Safety Equipment Co. has developed a line of goggle clips. They maintain the position of the goggles whether they are raised or lowered. The elastic head band is inserted into the clips without removing it from the goggles. Clips are easily attached to and removed from the hats or caps.

APPROVED PAINT RESPIRATOR

(Use Key # 756 on Inquiry Card on page 33)

PULMOSAN Safety Equipment Corp. has announced a new U. S. Bureau of Mines Approved Paint Spray Respirator . . . C 251. It protects against all paint sprays and vapors, lead-based enamels and lacquers. This respirator is part of the interchangeable C 200 Series. It is lightweight (less than 8 ounces), a single cartridge respirator with all parts independently replaceable.

SILICONES WATERPROOF MASONRY

(Use Key # 757 on Inquiry Card on page 33)

THE INTRODUCTION of new silicone resins into Monroe Monoseal has produced a more effective method of stopping moisture seepage through masonry walls without altering the appearance. A single application of this crystal clear liquid closes pores in brick, concrete block, stone and other masonry surfaces, preventing dirt and soot accumulation and eliminating efflorescence. This invisible liquid is a combination of silicone resins, penetrating and aromatic solvents. Weather or hot sun will not affect or damage the water repellency of this product. Does not stop the normal breathing process of the wall construction. Applied by wide brush or spray. Available in 55, 30 and 5 gallon containers.

REUSABLE PAPER WIPERS

(Use Key # 758 on Inquiry Card on page 33)

KIMBERLY-CLARK CORP. has run a testing program to determine the best wiping material for industry. The result is Kimtowels disposable shop towels, a wood cellulose product designed to replace laundered cloth towels and rags at half the cost. They are said to be the first heavy duty paper shop towel designed to be reusable. While they should be disposed of after some uses, these heavy-duty towels will hold up through many types of multiple applications.

The new shop towel is said to be lint free and to have high tensile strength and quick absorbency. Recommended for wiping bearings, cleaning gears, polishing gauges, soaking up oil spillage and most other applications for which cloth towels are used. Saturated with solvent, it also may be used to clean machine tools or to pick up chips and shavings. In packages of 50, the disposable towels have a quarter fold and when unfolded are 13 by 15 inches. Special metal dispensers are available.

DERMATITIS CONTROL KIT

(Use Key # 759 on Inquiry Card on page 33)

WITH THOUSANDS of new industrial uses for epoxies, resins, solvents, and chemicals, thousands of workers turn up on the sick list because of dermatitis, or skin irritations. A new program of skin and product protection has been developed by Indco Lab, manufacturers of skin conditioner, protective glove, water rinse hand cleaner and waterless skin cleanser. To set up a planned program of skin irritation control, Indco is offering an Introductory Kit that meets the needs of 4 workers for a 30 day evaluation.

RAINY DAY PAPER RUNNERS

(Use Key # 760 on Inquiry Card on page 33)

B. H. JORDAN CO. announces rolls of new disposable rainy day runners creped for a soft carpet-like resilience at a low throwaway price. This scuff resistant paper is tinted a soft neutral shade of green. It is put up on rolls 1000 feet long. Jordan will imprint the runners with any name or design at no additional cost and in any color to produce an attractive embossed effect. Samples are available.

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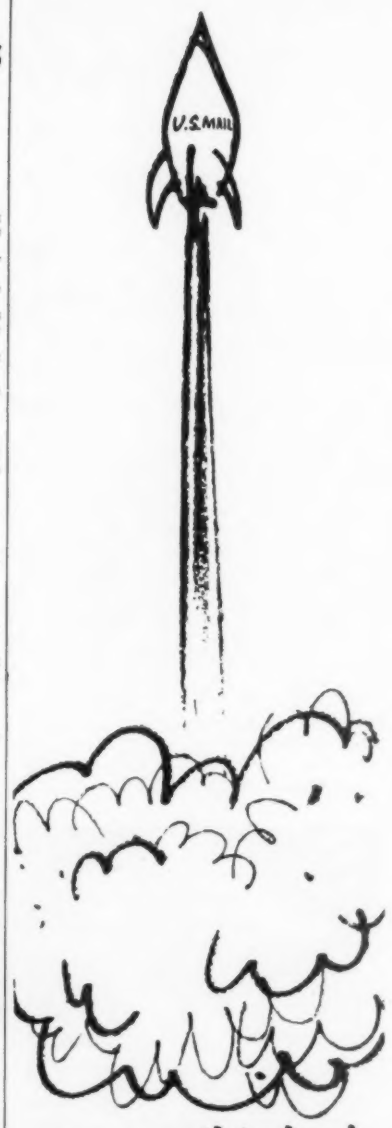

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1. Siver, R.H.: Current Medical Digest, Vol. XXI, September 1954.

2. Weekes, D.J.: New York State Journal of Medicine, Vol. 58, August 1958.

HWD

HYNSON, WESTCOTT & DUNNING, INC.

BALTIMORE 1, MD.

For details use Key # J-20 on card on page 33